Service Procedure 700/800/900 Series

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SAFETY REGULATION – WARNING

Please refer to the Safety Regulation information for each machine in the Bernina Factory Service Manual and the Safety Regulation information in the My Bernina Guide Book.

All electrical and electronic components operate at dangerous voltages. The mains plug must be withdrawn before making any adjustments to the machine. Wait about 30 seconds after removing the plug (capacitor discharge).

If two pieces of insulating material (i.e. shoe sole and floor) rub together, there can be a buildup of static electricity. Should this static charge be discharged through electronic components, they can be seriously damaged. One of the most effective ways of conducting these charges away is by grounding. This can be accomplished by using the grounding mat and wrist strap provided by Bernina of America, Inc.

This manual is **not** intended to be complete and to replace any original factory manuals. Its purpose is solely to educate Bernina dealers and their technician. For any additional factory settings, please refer to the corresponding factory service manual.

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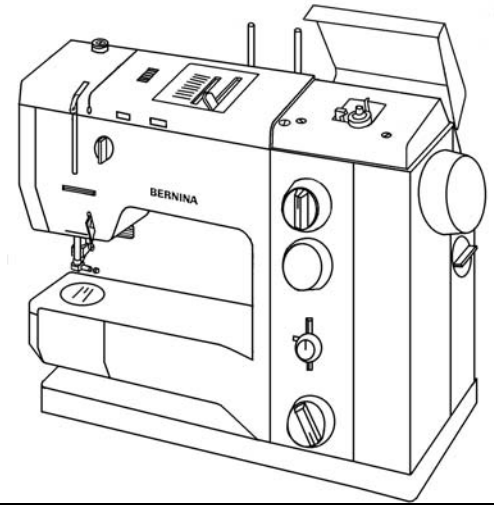
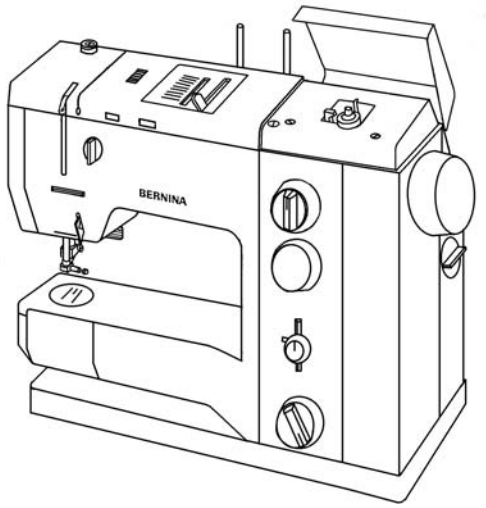
Part	Description	Possible Malfunction	Repair Instructions	Picture
Machine	Check for overall physical appearance, damaged/scratched cover, bent or broken spool pins, button, knobs and levers.		Scratches in paint can be polished or touched up with touch-up paint. Broken parts are replaced.	
Machine	Run machine if possible to get a feel for the overall conditions. Change stitch length, stitch width, needle position, select different stitches and features, check sewing light etc.		Note your findings and proceed.	

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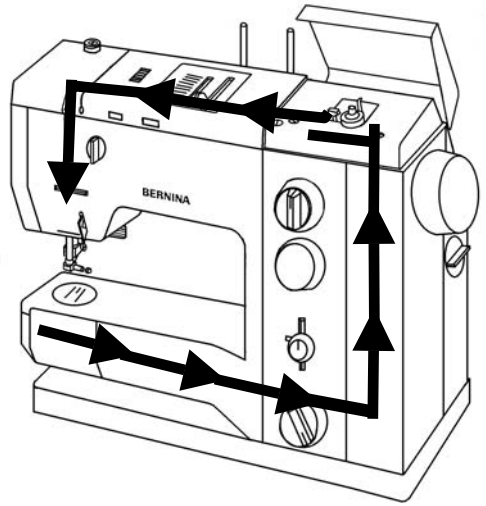
Part	Description	Possible Malfunction	Repair Instructions	Picture
Service Procedure	In order to follow a systematic service procedure we recommend to follow the sequence outlined in this manual			

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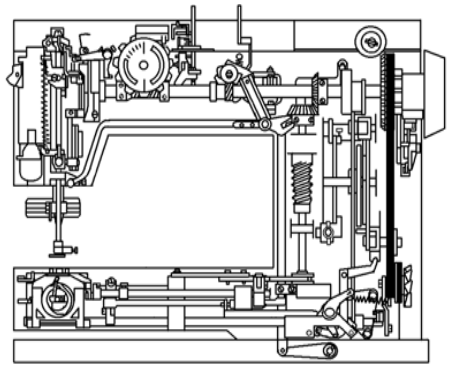
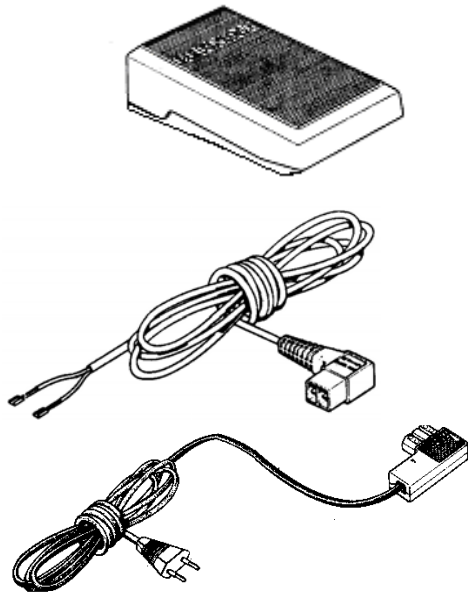
Part	Description	Possible Malfunction	Repair Instructions	Picture
Clean and lubricate the entire machine				
Foot control and power cord	Check foot control cover for physical damage, check foot control cord for damage Check power cord and plug for damage.	Consumer safety hazard. Inconsistent speed control Machine hesitation	Replace foot control covers and cord. Replace power cord.	

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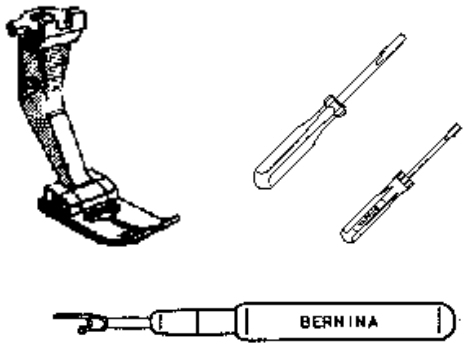
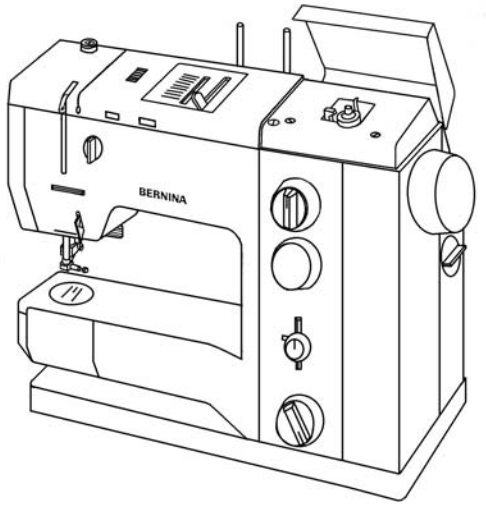
Part	Description	Possible Malfunction	Repair Instructions	Picture
Accessories	Check the condition of the accessories such as presser feet and bobbins.		Replace the individual accessory	
Free arm cover plate	The cover plate should fit tightly on top of the free arm	• Inconsistent buttonholes. • Inconsistent fabric feed. • Hollow sound • Tape used as a fabric guide too close to the presser foot can cause fabric feed retardation.	With the cover mounted and using the knuckles of you finger, tap all the way around the edges of the cover. If the cover does not fit flush with the arm a clanking sound can be heard. Adjust the cover by aligning it with the top of the free arm and the locking mechanism. Remove tape from free arm cover and suggest to the consumer to use a presser foot with a fabric guide instead.	

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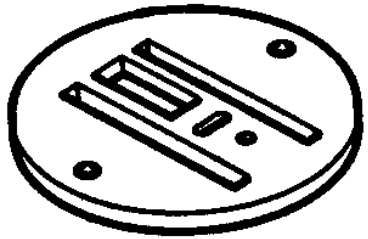
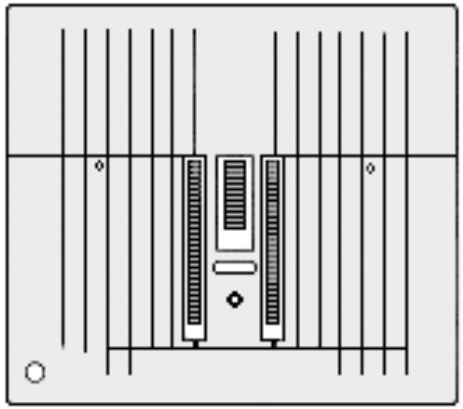
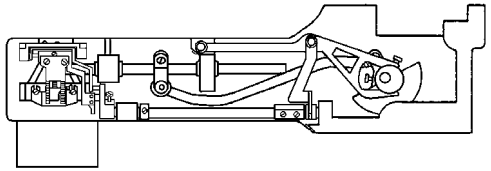
Part	Description	Possible Malfunction	Repair Instructions	Picture
Needle Plate	The needle plate should be smooth and polished, especially around the stitch hole.	• Thread breaking or shredding • Looping stitches • Skipped stitches • Fabric feeding issues. • Difficulties sewing lightweight and elastic fabrics.	Polish or replace the needle plate. When polishing the plate be careful not to enlarge the stitch hole.	
Feed Dog	At stitch length maximum the feed dog should not touch the front or rear at its full forward and reverse stroke. The feed dog must to be parallel and in the center of the needle plate The teeth should be sharp and complete. Both rows of feed dog teeth have to be the same height.	• Buttonhole feeding problem • Loud knocking sound on longer stitch length • Feeding problems	Adjust or replace feed dog. **INSTRUCTION IN PART 2.2**	
Feed dog support and driving mechanism	The feed dog, feed dog support and feed dog driving shaft should move bind and play free.	• Buttonhole feeding problem • Knocking sound on longer stitch length • Feeding problems	Tighten the feed dog support mechanism. Remove the base plate and eliminate the play in the drive shaft by tightening the collar against the bushing.	

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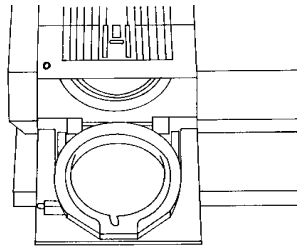
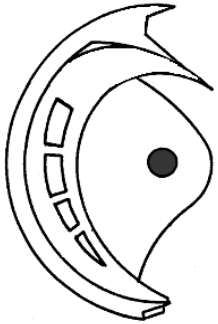
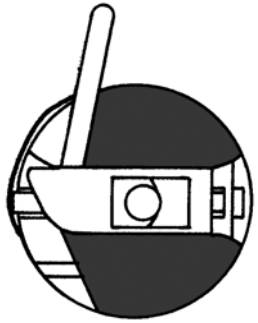
Part	Description	Possible Malfunction	Repair Instructions	Picture
Shuttle Race Cover	Check for wear and tear created by the hook and for burrs created by the needle and hook. The race cover has to be smooth, and should fit flush against the shuttle race.	• Skipped stitches • Looped stitches • Thread breaking • Hook noise	Adjust or replace	
Hook	The hook and hook tip should be sharp, smooth and polished. Check hook for wear marks at the running surface.	• Skipping stitches • Looping stitches • Thread breaking • Thread jamming • Thread fraying • Hook noise	Sharpen and polish hook point. Be careful not to change the shape of the hook tip. If the hook is dropped on the tip the tip might be broken off or the tip is bent, replace hook.	
Bobbin Case	The bobbin case should be smooth, polished and free of corrosion. There should be no lint between the bobbin case and the tension spring. The tension spring creates equal tension when the thread released on the left and right hand side of the spring.	• Inconsistent tension	• Adjust tension and tension spring for consistent and equal tension. • Polish the bobbin case body • Tighten the inside and the spring securing screw **(not the tension adjusting screw)**	

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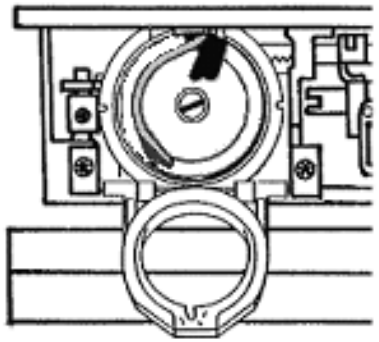
Part	Description	Possible Malfunction	Repair Instructions	Picture
Bobbin Case (cont.)			• Adjust bobbin case tension. • Make sure a genuine Bernina bobbin case is used.	
Shuttle Race	The race should be smooth, clean and lubricated. Check for scarring marks or particles embedded into recess and the running surface.	• Loud hook noise	Using a toothpick or an ear swab, remove the particles from the running surface and the recess. Replace if the race is worn or the grooves are too excessive.	

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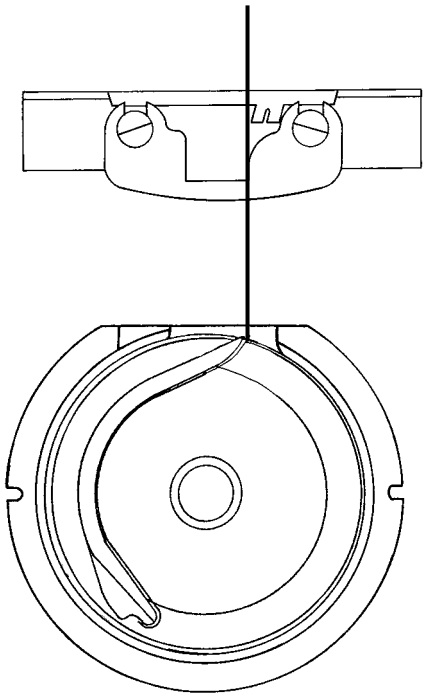
Part	Description	Possible Malfunction	Repair Instructions	Picture
Driver	The driver pushes the hook in an oscillating motion. When the driver changes directions the spring should absorb the impact of the hook's momentum. The driver is equipped with needle guards/deflectors. The driver should be free of radial play.	• Skipped stitches • Noise in hook area • Looping stitches • Thread breaking • Thread fraying	Remove the driver; clean the driver teeth, behind the driver spring, driver shaft, bushing and rack. Remove any burrs from spring and driver body. Check driver spring for: Hair line creaks and if spring has play on both sides. Before placing the driver back in to the machine lubricate the driver shaft. Also make sure to maintain a 0.3mm thread passing clearance between the hook and the driver and no play exists between rack and driver. To eliminate play carefully rotate the rack counter clockwise.	

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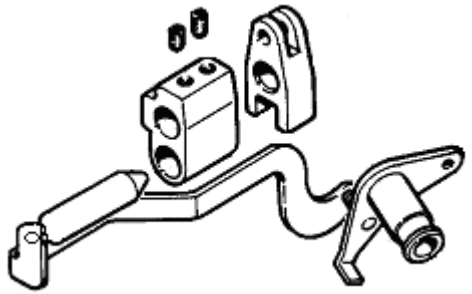
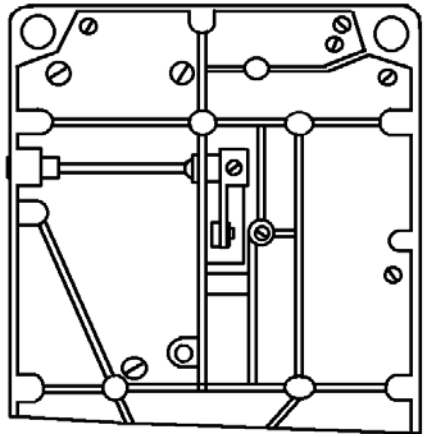
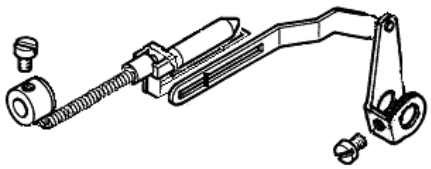
Part	Description	Possible Malfunction	Repair Instructions	Picture
Sewing/ Darning Mechanism	When switching from sewing to daring (dropping the feed dog) the feed dog should rise on lower.	• Feeding problem • Feed dog can't be lowered	Clean, oil, adjust **INSTRUCT10N IN PART 2.13**	
Free Hand System (FHS)	The system raises and lowers the presser foot. With the presser foot lifter lever in the up position it releases the lifter lever. The top tension is released. With late Models 930 the feed dog drops as well. The shaft in the base plate is play free and the knee lifter lever is held securely inside that shaft.	• Hand lifter lever cannot be lowered • Presser foot cannot be lifted • Knee lifter lever hangs loose. • Knee lifter is not held securely in the machine. • Feed dog does not lower. (Late Model 930 only)	• Eliminate play in the lifter shaft. • Replace knee lever if the lever does not stay in shaft securely. • Replace tension spring behind motor if lever hangs loose. (Model 830) • Clean, lubricate and adjust drop mechanism (Model 930) check the distance of 38mm between the collar and the coupling half.	 

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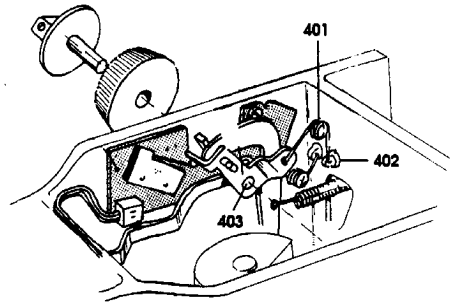
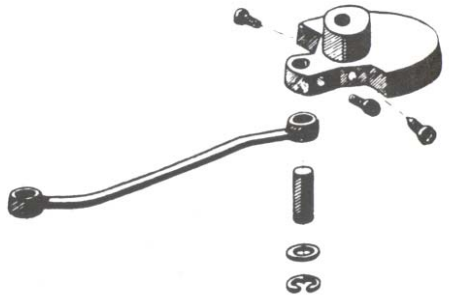
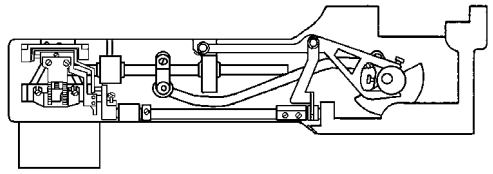
Part	Description	Possible Malfunction	Repair Instructions	Picture
Model 930 LED/Switching operation (red/ green stitches)	When selecting either "red or green" stitches the knob has to stay securely in place during machine operation. The LED red & green indicator is changing on top and bottom.	• No definite switching operation between red/ green • During operation the change over knob rocks from left to right. • No LED indication	Clean micro switch located on the 930 PCB Update spring support Replace PCB's if necessary. Check plug connections at L-Print **INSTRUCTI0N IN PART 2.10**	
Model 830 Feed Dog Eccentric	The feed dog eccentric controls the feed dogs up and down motion.	• Loud noise in free arm • Feeding problem • Inconsistent buttonhole • The plastic eccentric is cracked or missing.	Check if the nylon eccentric shows hairline cracks. Check if the follower/fork wore a groove into the eccentric. Replace if needed **INSTRUCT10N IN PART 2.1**	
Model 930 Feed Dog Eccentric and feed dog drive	The feed dog eccentric controls the feed dogs up and down motion. The linkage must move freely, must be play free and lubricated.	• Loud noise in free arm • Feeding problem • Inconsistent buttonhole	Disassemble the driving mechanism. Clean and lubricate the linkages. Replace parts if play is excessive.	

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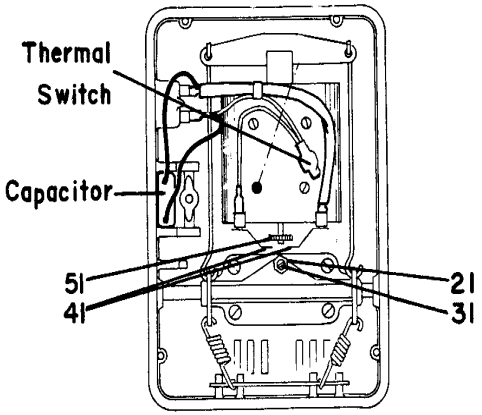
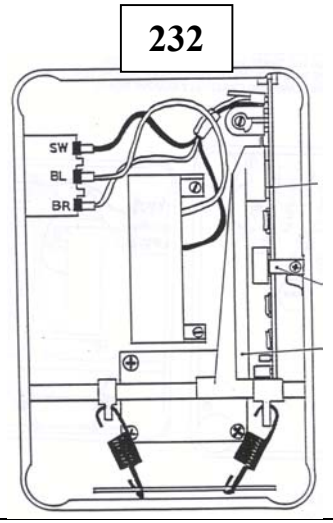
Part	Description	Possible Malfunction	Repair Instructions	Picture
Foot Control Non-Electronic Type: 213	The foot control controls the speed of the machine. As the foot control is pressed hundred of internal carbon discs are pressed together, reducing the resistance, thus gradually increasing the machines speed. **Warning:** **Make sure the (T) thermo switch has been installed**. .	• Hot controller when sewing on slow speed • Cuts out after a certain time when sewing at slow speed. • Speed hesitation when controler is pushed.	**Install thermo safety switch if (T) is missing.** Replace rheostat Install cooling plate if needed. Adjust start and full speed. When sewing at slow speed use the min/max switch. This will reduce the heat generation inside the foot control.	
Foot Control Electronic Type: 232/290	The foot control controls the speed of the machine. When the foot control is pushed an audible micro switch click can be heard, the machine runs smoothly at the speed of 180 rpm/min. As the control is pressed further, the speed should gradually increase until the machine reaches the top speed of 1050 rpm.	• Inconsistent start speed • Machine only runs at slow speed. • Machine only runs at fast speed • Machine stutters at start speed. • The machine hesitates when foot control is pushed.	Adjust start speed by turning the potentio-meter. Replace broken carbon pins Replace circuit board. **(See website for board repair instructions)** Clean the resistor plate.	

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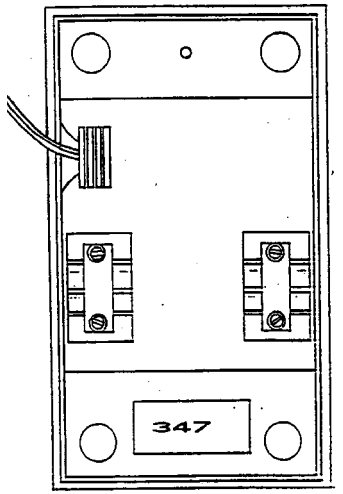
Part	Description	Possible Malfunction	Repair Instructions	Picture
Foot Control Electronic Type: 347/366	The foot control controls the speed of the machine. As the control is pressed, the speed should gradually increase until the machine reaches the top speed of 1050 rpm. When the foot control is released the machine stops instantly with the take up lever stopping at the highest point. With some foot controls while pushing the control with the heel the needle stops down.	• The machine hesitates when foot control is pushed. • The machine does not run at all. • No gradual speed increase. • Needle stop kicks in when it should not.	Clean the resistor plate Replace broken carbon pins Replace the resistor plate.	
Off/Max/Min Switch	Check the different switch operation on the older models 730, 830 (non-electronic) and the models 930-910.	• Does not switch to slower or higher speed.	Models 730/830 Check if diode is plugged in bottom of Max/Min switch. Check if the motor is wired correctly. Models 930/910: Repair circuit board	**930**

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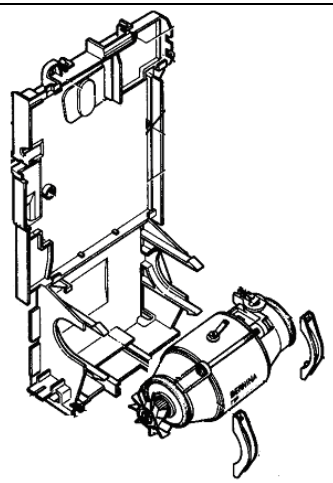
Part	Description	Possible Malfunction	Repair Instructions	Picture
Motor bracket/Motor housing	It supports the motor and the printed circuit board. Model 930 the clips and the bracket holding the motor secure have a tendency to become bridle over time	• Loose belt tension, • Loud belt transmission noise	Replace the faulty part	

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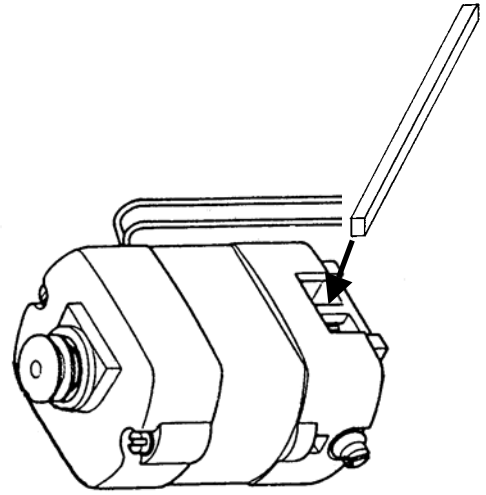
Part	Description	Possible Malfunction	Repair Instructions	Picture
Motor	The motor drives the machine. Electronically controlled motors usually allow increasing the piercing power of the needle while maintaining the same speed. The motor is quiet running and powerful.	• Motor does not run • Slow and sluggish • Motor is getting hot • Excess motor noise • Arcing around armitor	The Model 730 and 830 brushes need to be checked frequently. The Model 930 and 910 brushes and the armitor do not need to be checked, unless the machine does not work and you suspect the motor. Clean armitor with green armitor cleaner. Check or replace motor brushes (always check and replace both at the same time). Replace brushes when ½ worn down. Lubricate each side of the bushings. (all motors) Warning if the Model 730/830 brushes are worn out, the spring behind the brushes will not stop and will damage the armitor.	

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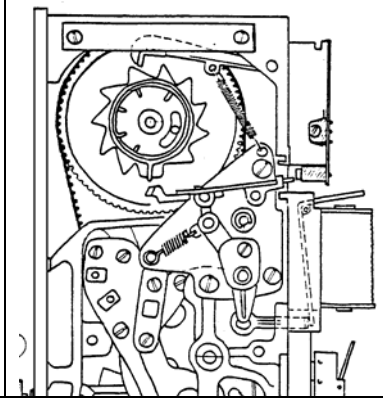
Part	Description	Possible Malfunction	Repair Instructions	Picture
Driving belts	The belts transmit the power from the motor to the machine. They have 100% traction and are quiet.	• No needle penetrating power • Squeaking sounds from motor side. • Binding machine	Check for belt wear and replace if necessary. Adjust the belt tension. Squeaky belts can be quieted by running the belts though a bar of soap.	

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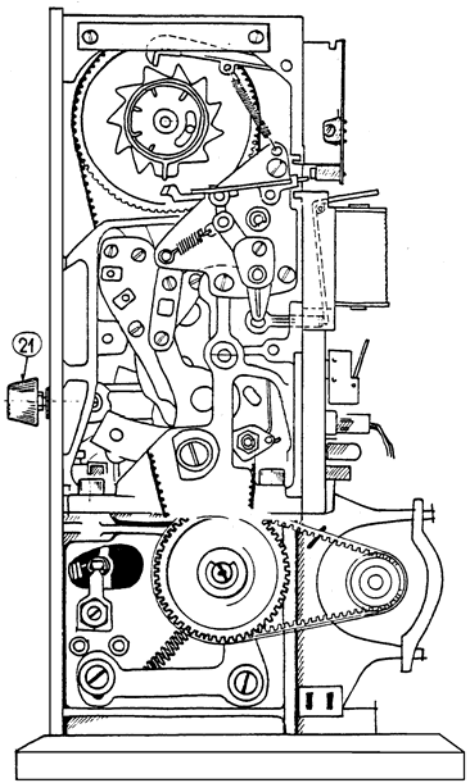
Part	Description	Possible Malfunction	Repair Instructions	Picture
Belt transmission	Transmits the motion from the motor to the hand wheel.	• Clinging sound from hand wheel side.	Clean and lubricate the step pulley shaft.	

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Part	Description	Possible Malfunction	Repair Instructions	Picture
Model 730/830 Hand wheel and hand wheel release. Model 930 automatically releases the hand wheel when the winder cover is lifted.	The hand wheel aids the positioning of the needle and the take up lever. The hand wheel release disconnects the driving motor/hand wheel from the machine for winding bobbins. When the hand wheel is release the needle should remain stationary while winding the bobbin. When the hand wheel is engaged the needle should have full penetrating power. Check for any thread that may be wrapped around the step pulley and handwheel.	• Loud low rattling sound transmission from hand wheel. • The needle moves when the hand wheel is released. • The needle has no penetrating power.	• Remove hand wheel • Remove thread behind wheel. • Clean the center of the handwheel and the flange from the main shaft. Note: Hand wheels with internal metal bushing need to be lubricated, hand wheels without bushing need to run dry. • Adjust belt tension. • Adjust hand wheel release mechanism	

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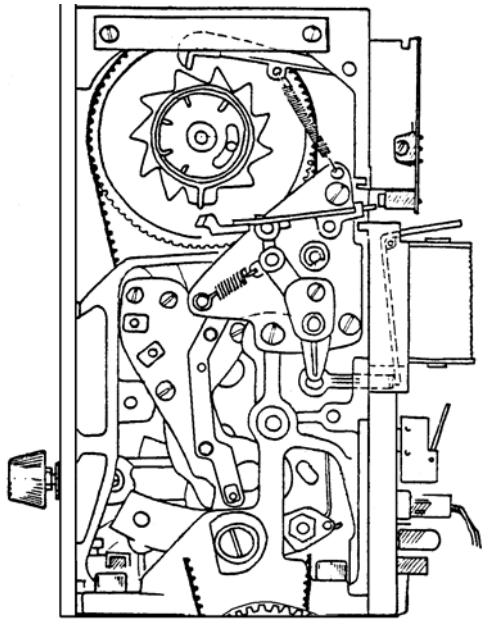
Part	Description	Possible Malfunction	Repair Instructions	Picture
Hand wheel and needle stop up and down (930)	The hand wheel aids the positioning of the needle and the take up lever. When the machine is stopped from full speed, the take up lever should stop at the highest point. When the machine is stopped from slow speed the lower part of the take up lever should be above the edge were the top cover meets the upper frame. For machines with the needle stop down feature press the rear of the foot control, the needle should stop down in the needle plate.	• Wobbling hand wheel. • Inconsistent needle stopping position, up or down. • Loud and erratic stopping action • No release action after the machine comes to a complete stop. (Hand wheel binds)	• Remove thread behind wheel. • Check if hand wheel is mounted correctly. • Replace damaged hand wheel. • Remove hand wheel, black sleeve and spring. • Check main shaft flange, spring and sleeve for wear, replace if needed. • Remove grooves in flange with polishing cloth. • Clean and lubricate flange, spring and sleeve. • Check flange screw for tightness. • Replace notched segment with new style and adjust **INSTRUCTI0N IN PARTS 3.2, 3.3**	

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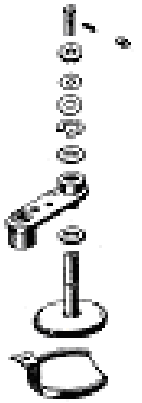
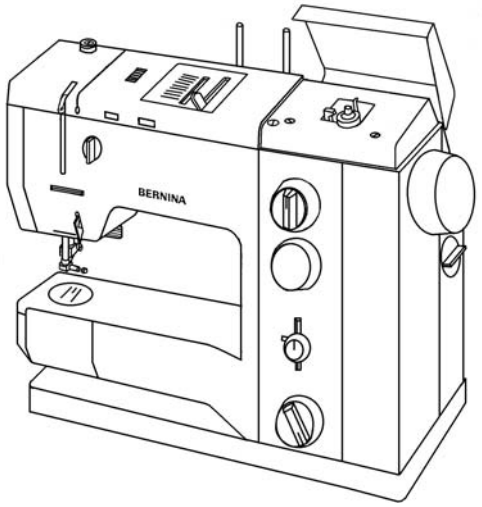
Part	Description	Possible Malfunction	Repair Instructions	Picture
Bobbin Winder	When winding a bobbin the bobbin is held securely on the spindle and rotates quietly at full speed without hesitations. The bobbin fills evenly, the winding action stops automatically when the bobbin is full.	• Winder slippage • Loud winder • No winding action • Uneven winding • Over filling/under filling	Model 830 the rubber winder wheel may have crystallized. Replace and adjust the wheel. For even winding and correct filling amount follow machine specific adjustments. **730 BOBBIN WINDER INSTRUCTION IN PART 2.11**	**730** **830** 
Needle position knob	The needle can be moved and locked into 5 different needle positions. The knob is spring loaded towards the left when using the automatic button hole mechanism	• The selected position is not held secure. • Buttonhole beads are not in the correct position.	Check internal locking mechanism. 730/830 pistons for spring action. 930 check if the lock spring is attached. Select buttonhole position #5 and check if the needle-positioning knob is spring loaded towards the left hand side.	

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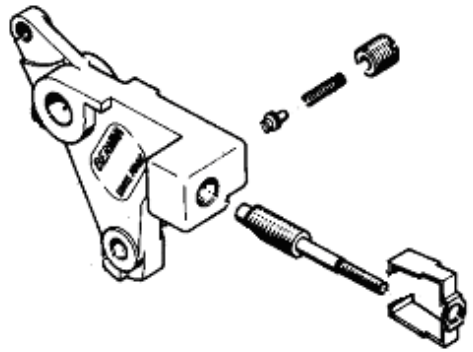
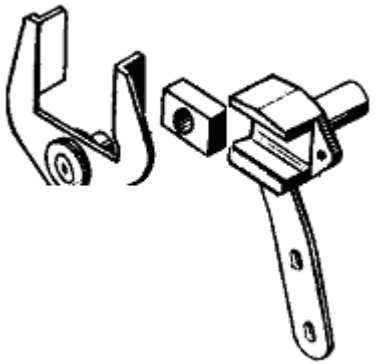
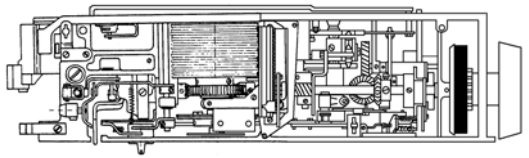
Part	Description	Possible Malfunction	Repair Instructions	Picture
Stitch length lever	The stitch length lever controls the stitch length. When raised above zero, the machine sews in reverse.	• The lever hangs up or bounces. • Buttonhole density is inconsistent. • The knob can be removed with the entire shaft • In the older model 830, the stitch length lever might be updated with a newer style	Lubricate the stitch length crank below the main shaft. Check for binds in the stitch length mechanism and feed dog drive mechanism. Align the advance eccentric with advance length fork. Remove the entire knob and shaft, remove all broken parts and replace stop-clip. Model 830 replace old style with new style stitch length lever Clean and adjust as needed **INSTRUCTION IN PART 2.3**	  

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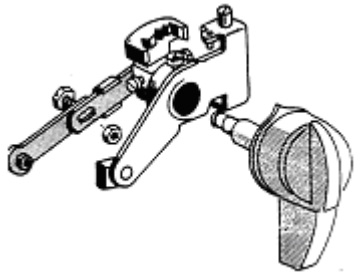
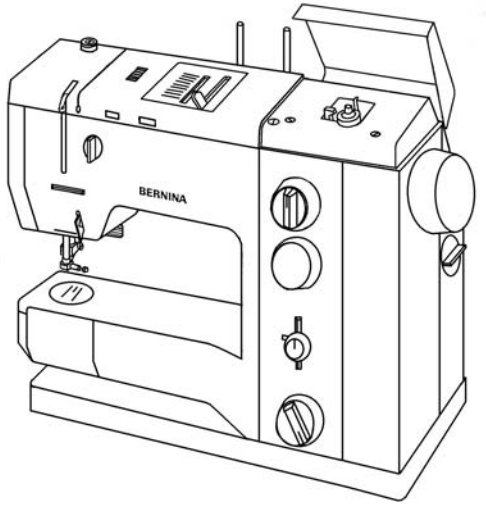
Part	Description	Possible Malfunction	Repair Instructions	Picture
730 Stitch Width Knob	To sew a buttonhole the wing of the stitch width lever needs to be pulled down; refer to the 730-guide book.	• The wing cannot be pulled down. In some cases dryness of oil could cause the lever to be immobile.	**Danger: do not force the lever in any way or form. The part is no longer available!** **INSTRUCTION IN PART 2.14**	
830/930 stitch width knob	The stitch width knob controls the stitch width.	• The knob sticks • The buttonhole beads are not in the correct position. • The bar tack covers the beads.	Select buttonhole position #5 and check if the stitch width knob is spring loaded towards the left hand side. Check if the needle bar moves freely. Move the change over lever between zero and 1-20 (not engaged in either position) adjust max stitch width the needle bar should be “sloppy loose”	

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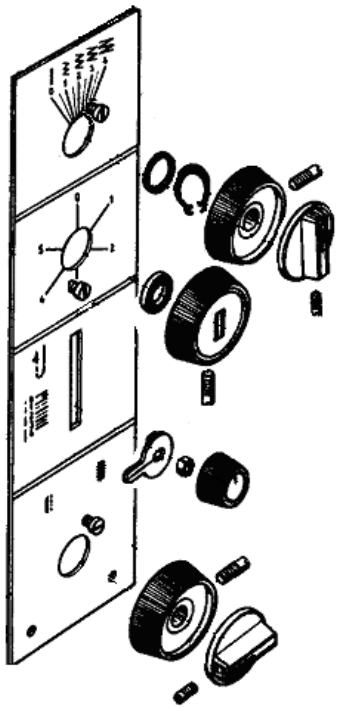
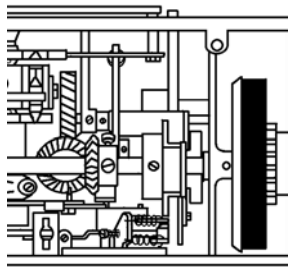
Part	Description	Possible Malfunction	Repair Instructions	Picture
Knobs	All knobs are line up with the marks on the face plate		Adjust as needed	
Bevel Gear	The gears transfer the motion from the main shaft to the vertical shaft. The gears are bind and play free.	• Rattling noise • Grinding noise • Skipped stitches	Adjust gear play Lubricate the vertical shaft though the vertical hollowed bore hole.	

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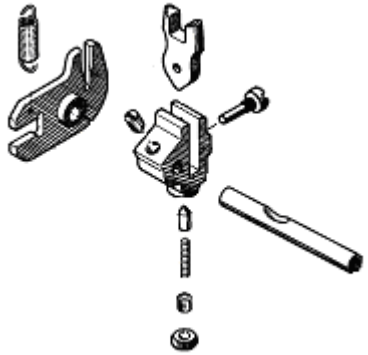
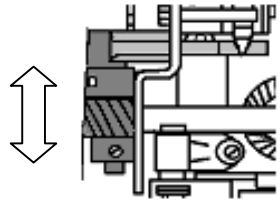
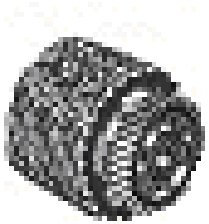
Part	Description	Possible Malfunction	Repair Instructions	Picture
Changeover Lever	The changeover lever selects between the rigidly and the spring-loaded needle drive system. It completely engages with **one click** between 0 and 1-20 positions.	• Inconsistent needle bar movement. • Needle breakage. • Needle swings past the needle plate.	Remove and clean changeover lever **INSTRUCTION 1N PART 2.7**	
Zigzag eccentric	This eccentric controls the rigidly guided needle bar.	• Rattling sound • Bind in hand wheel	Adjust play to/fro and radial play of the eccentric. Lubricate the gear and the center shaft though the borehole.	
Cam Stack Gear	The cam stack gear holds all the decorative and utility stitch cams. The gear rotates play free and smoothly.	**Model 830** • Machine slows down every revolution of cam stack gear • Machine freezes **All machines** • Inconsistent stitch pattern • Clanking noise when using the cams	Replace broken cam stack gear. Remove to/fro and radial play, Do not grease the cam stack gear, lubricate the cams. **INSTRUCTION IN PART 2.4**	

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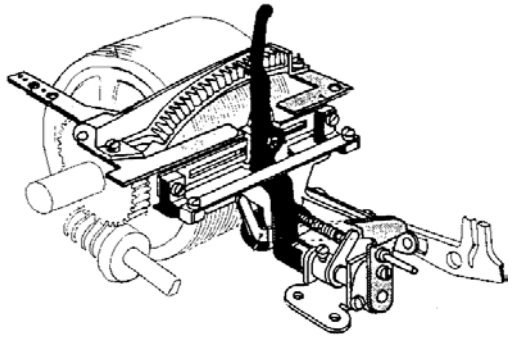
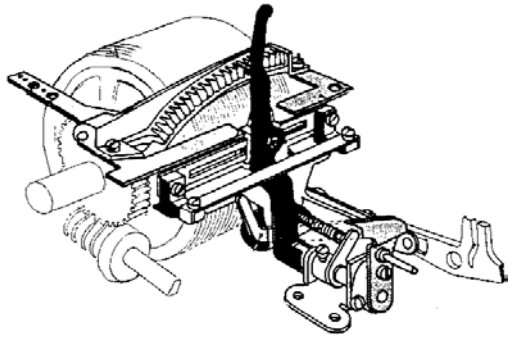
Part	Description	Possible Malfunction	Repair Instructions	Picture
Notched segment	The segment securely positions the follower when using stitches in section 1-20.	• Inconsistent patterns • Clanking sound when using the cams.	Position the follower and tighten the notched segment screws. **Note:** when servicing always check the two-notched segments screws for tightness.	
Cam Follower	The cam follower follows the cam contour and picks up the high and low slopes.	• Inconsistent patterns • Clanking sound when using the cams.	The follower should be riding in the center of one single cam.	

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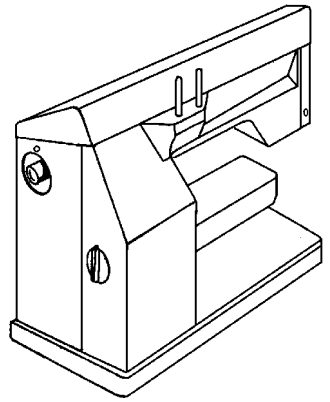
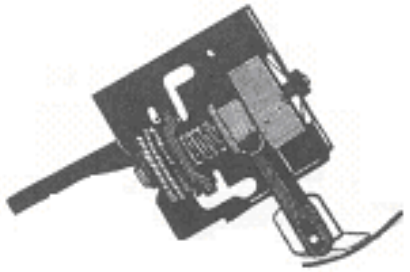
Part	Description	Possible Malfunction	Repair Instructions	Picture
Spool Holder	The spool holder supports the spools and warrants a smooth thread release.	• Inconsistent thread release. • Inconsistent tension	Replace damaged spool pins. Clean off sticky residue from spool pins. Make sure the pins are straight and the felt disks are installed.	
Top Tension	When the top tension indicator is set at the red mark and the presser foot is down the resistance applied to the thread creates a perfect tension and stitch formation. When the presser foot is lifted either by the lever in the back or by the free hand system the top tension releases, when the presser foot is lowered the tension engages. The center disc is straight, parallel and equally distributed in the slot of the top cover.	• No top tension when presser foot is down. • Random and inconsistent tension. • Loose or tight top tension. • Looping on the bottom of the fabric.	Clean between the discs with cordonnet thread and blow out the lint. Align the center disc. Check for correct tension release. Adjust and calibrate the top tension. Check tension discs for thread wear.	

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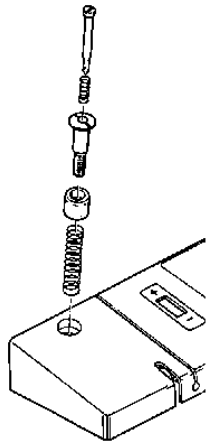
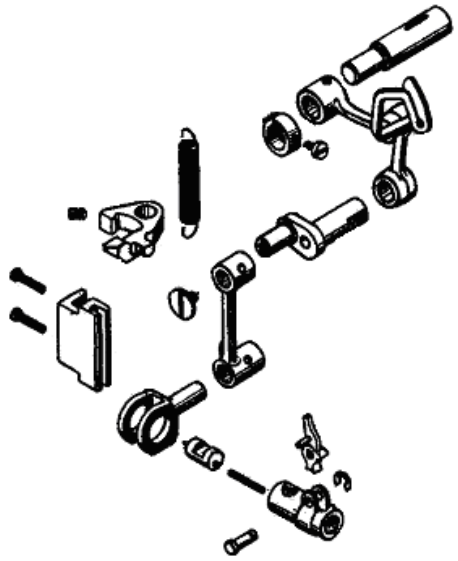
Part	Description	Possible Malfunction	Repair Instructions	Picture
Bobbin winder pre-tension.	Creates the correct pretension and correct position for successful bobbin winding.	• Bobbin thread loose, • Bobbin unevenly wounded, too full or not full enough.	Check unit for spring action. Clean and adjust the tensioner.	
Take-Up Lever	The take-up lever controls the thread flow in the machine. There is no play in the lever or its joints. The hand wheel should be free moving.	• Binding with every revolution of handwheel • Noisy • Unthreading of take up lever. • Inconsistent loop formation.	Remove any threads that might be wrapped around the linkages. Lubricate the linkages and adjust so free of play and bind. Adjust or replace if broken or bent. **INSTRUCTION IN PART 2.5**	

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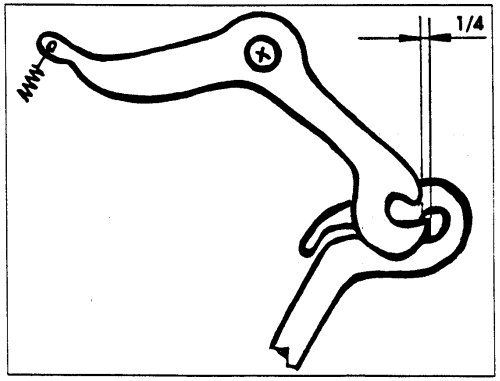
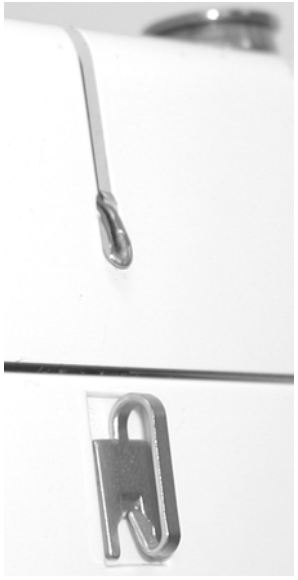
Part	Description	Possible Malfunction	Repair Instructions	Picture
Thread Catcher 930	The lever catches the top thread while the needle bar is disengaged.	• Broken catcher • Unthreading of take-up lever • Damaged take-up lever	Adjust or replace if broken **INSTRUCTION IN PART 3.1-g**	
Thread guides	The guides guide the thread to the right place and prevent the thread from cutting in to the paint and metal fame.	• Thread fraying and breaking • Inconsistent tensions • Damage of paint	Replace damaged and worn thread guides.	

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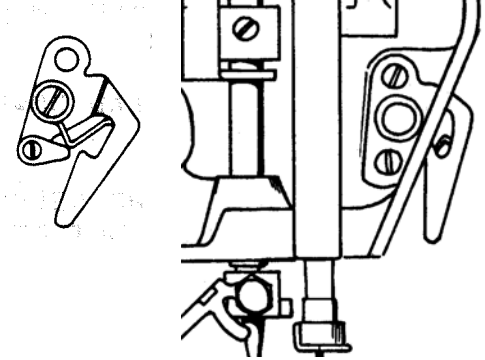
Part	Description	Possible Malfunction	Repair Instructions	Picture
Thread guides (cont.)				
Check spring/Thread regulator Spring	The spring holds the thread tight until the thread enters into the fabric.	• Thread breakage and fraying. • Inconsistent satin stitch. • Tick tick sound while sewing	Clean or replace the check spring. Adjust the spring pressure and the position.	

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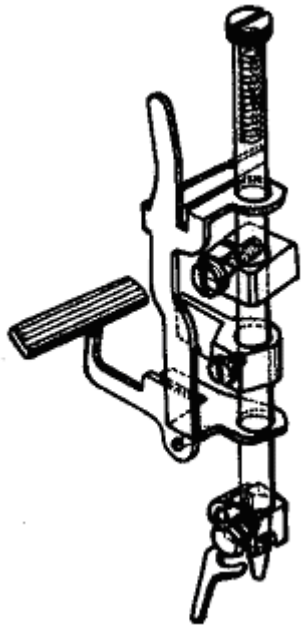
Part	Description	Possible Malfunction	Repair Instructions	Picture
Presser Foot Clamp	The clamp holds the presser foot securely; the foot is in line with the markings in the needle plate. The bar moves freely up and down.	• Crooked buttonhole • Loose presser foot • Feeding problems • No control over fabric motion (floating of fabric)	Adjust presser foot clamp. Remove presser foot bar **INSTRUCTIONS IN PART 2.8**	
Needle Bar Clamp	The clamp holds the needle securely.	• Needle falls out of the clamp • Thread fraying and breaking. • Skipping stitches • Skipping stitches when using double/triple needles • Needle breakage	Check the tip of the clamp screw. Replace when worn. Clean out the inside of the clamp. Check if secured tightly against the needle bar. Straighten the needle bar radialy.	

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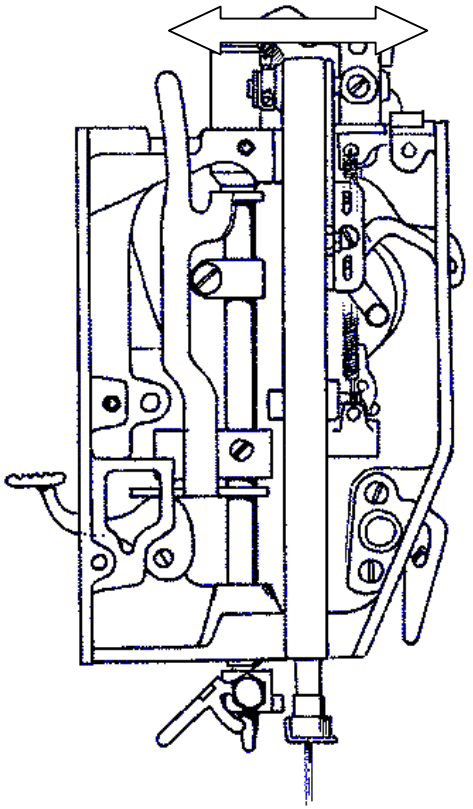
Part	Description	Possible Malfunction	Repair Instructions	Picture
Needle Bar Support	The needle bar support guides the needle bar straight up and down. The needle bar is driven by the drive mechanism. With the changeover lever between 0 and 1...20. (Not engaged in either position) and stitch width 4, the needle bar support should swing freely to the left and right. There is not too and fro play.	• Inconsistent stitch patterns using the cams. • Stitch width/LCR knob jamming • Buttonhole beads and bar tack problems.	Remove to and fro play. Adjust the needle bar support.	

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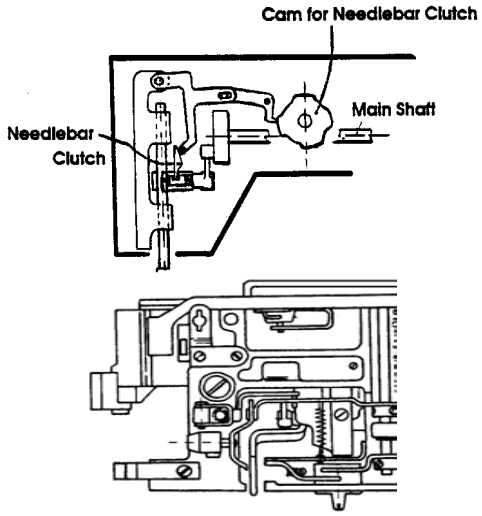
Part	Description	Possible Malfunction	Repair Instructions	Picture
Long Stitch and Basting 930	Select the basting stitch or long stitch and run the machine. The needle bar couples and decouples every other stitch or every sixth stitch.	• Needle bar remains in the up position. • Inconsistent basting/long stitch function • Loud banging sound at full speed. • Needle bar is twisted • Sticking clutch	Adjust needle bar cushioner.	

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Light Cover and Light Bulb 730/830	The light switch is turning the light on/off. The switch and the light harness are fastened securely against he cover.	• Flickering light • Rattling sound • Loose light covers	Replace light bulb Fasten the screws Secure the light cover.	**830**

After this check up, the machine needs a complete sewing-in. For that, use the two charts in this manual. The 830 chart can be used for most of the machines in the 800 series. The 930 chart can be used for the 930/931/932 and 910.

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The following instructions are written as step-by-step procedure to replace parts. Rough adjustments are included to the point that the machine can be fine tuned at a later stage. The Code Number refers to the last pages of this manual indicating what specific adjustment have to carried out after this particular parts was removed or replaced.

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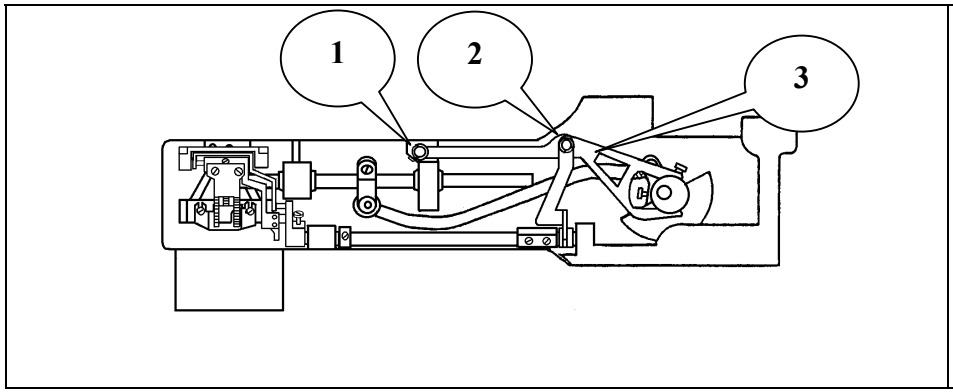
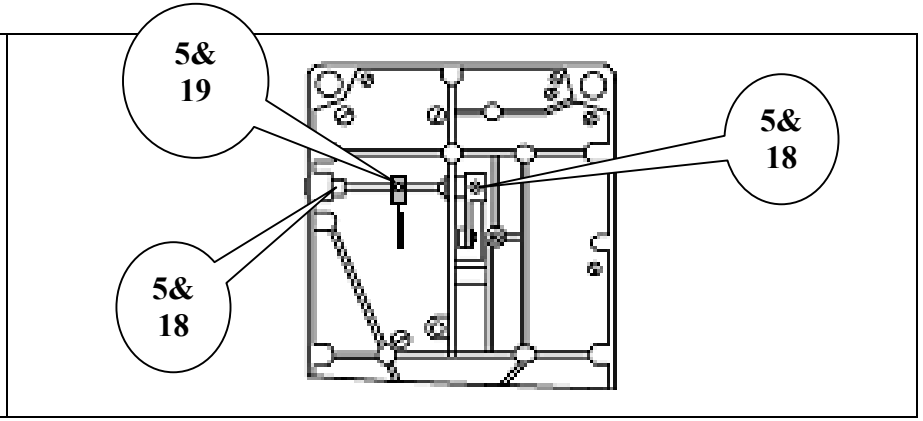
Code A

2.1 Exchange of Feed Dog Eccentric

1. **930 only,** remove the feed dog lifter mechanism by removing the far left hand shaft with C-clip and washer.
2. Remove the C-clip from the pivot point shaft, removed the shaft, three washers.
3. Pull the lifter fork to the left for removal.
4. Turn machine upside down and secure it to the workbench using two wooden blocks.
5. Loosen one or two screws from the shaft
6. Remove the shaft.
7. Remove all base plate and cover screws and remove the base plate.





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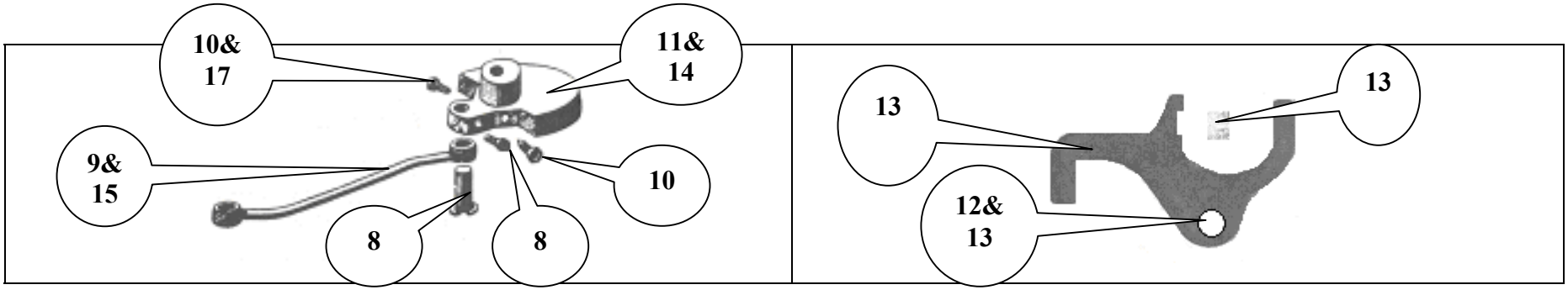
8. Loosen the screw and pulling out the shaft with C-clip and washer.
9. Disconnect rack assembly with feed dog eccentric by loosening one screw and pulling out the shaft with C-clip and washer.
10. Loosen and remove the rest of the screws on the feed dog eccentric.
11. Turn the eccentric to a convenient position so it can be easily removed. Please do apply any excess force as the aluminum arm can easily be bent.
12. Loosen the screw from the follower, remove the shaft, washer and C-clip in one piece.
13. Take the cam lever out of the machine and replace it with a new one. Fasten the setscrew and check if the follower moves freely. Place small amount grease on the nylon follower and fork to keep it in place.
14. Mount the new feed dog-eccentric back on the vertical shaft and make sure the nylon follower is in its proper position.
15. Connect the rack assembly with the feed dog eccentric and tighten the screw.
16. Rough adjustment:
    Set needle bar in its lowest position
    Set rack on its far left dead position
17. Tighten the flat-ended screw on the eccentric**, not the pointed screw!**
18. Install the base plate and free hand lever shaft play free and make sure the set crew is very tight.
19. **930 only**, leave the feed dog drop mechanism set screw loose. Mount the feed dog lifter mechanism, lubricate each joint and assemble.



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2.2 Feed Dog

Code B

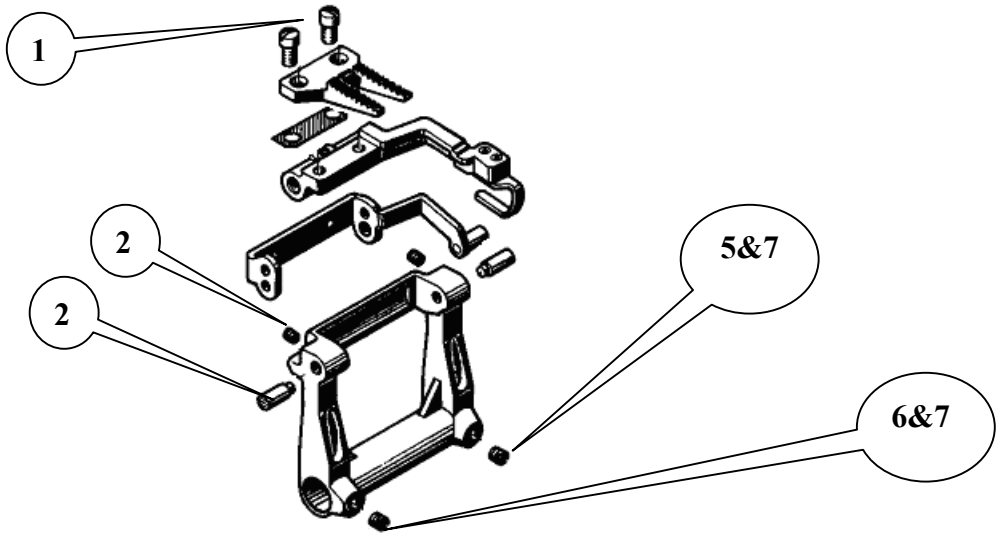
To level the feed dog, shims can be added or removed between the feed dog and feed dog support.

Shims are available in three thickness:

0.1mm -328.001.08
0.2mm -328.002.08
0.3mm -328.003.08

If the feed dog is not equally distributed within the needle plate follow these instructions.

- 12 Loosen the two feed dog-fastening screws and align the feed dog parallel to the needle plate.
- 12 Eliminate play in the feed dog by loosing the screw and moving the pivot pin.
- 12 Select the longest stitch length of 4mm.
- 12 Check feed dog distribution in respect to the needle plate: front, back, left and right.
- 12 Loosen one of the two screws on the feed dog support.
- 12 Insert a screw diver and loosen the second screw, using the screwdriver to direct the feed dog to the correct position.
- 12 Tighten both screws.



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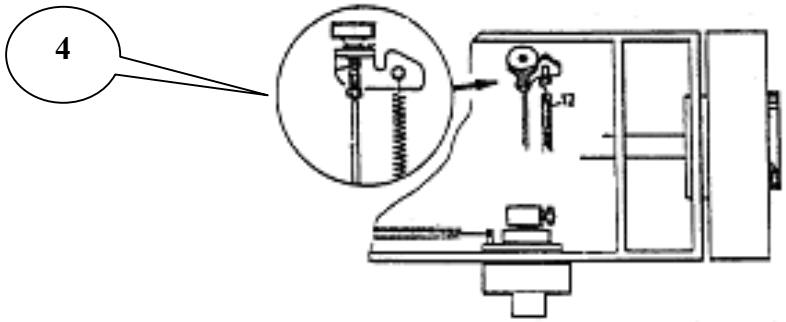
2.3 Stitch Length Lever

To identify if the model 830 needs a new style stitch length lever, open the top cover and check for a knurled aluminum screw inside towards the back right hand side. The old style stitch length lever mechanism needs to be replaced with a new style lever, # 313.351.04 (Model 830 production until 1973).

Code C



Removal:

1. Remove belt cover.
2. Select stitch length 0mm, buttonhole # 5 and remove all knobs.
3. Remove faceplate.
4. Remove knurled screw # 13, washer # 16 and spring # 14.

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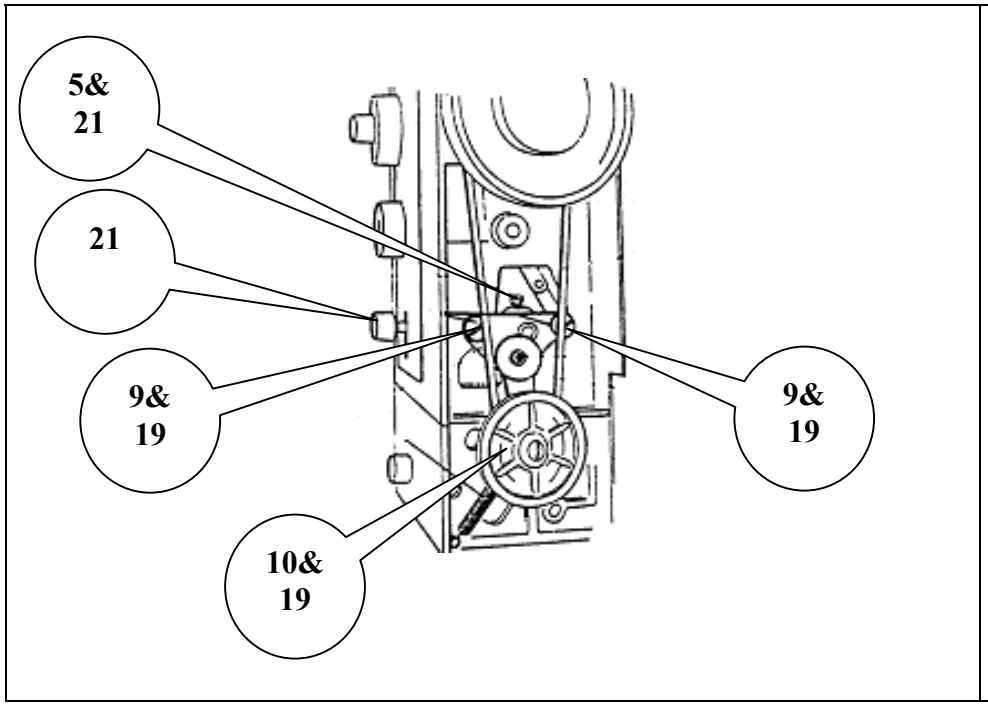
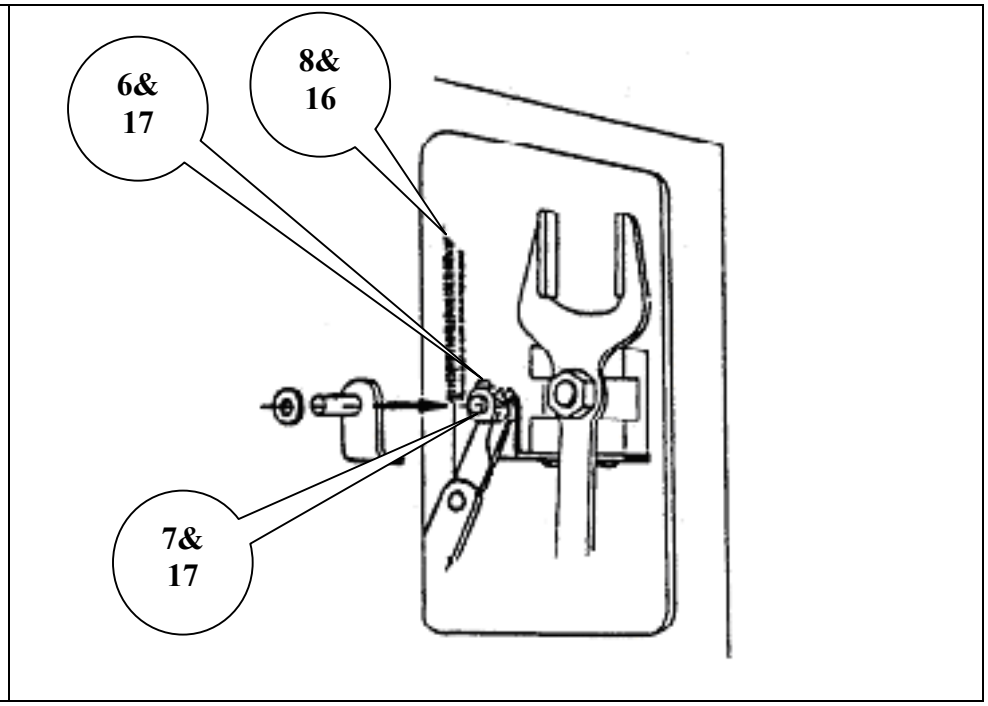
5. Loosen hex screw three revolutions; stitch length lever will drop down.
6. Loosen the two screws on collar One screw can be reached from the top of the machine.
   To reach the other screw, insert a small, long screwdriver into the cut out for the stitch length lever and loosen the second screw at an angle. The stitch length lever may have to raised or lowered to get to screws.
7. Take collar out of the machine.
8. Unhook spring.
9. Remove the two screws
10. Remove step pulley.
11. Carefully remove the whole stitch length mechanism. Do not apply any force.





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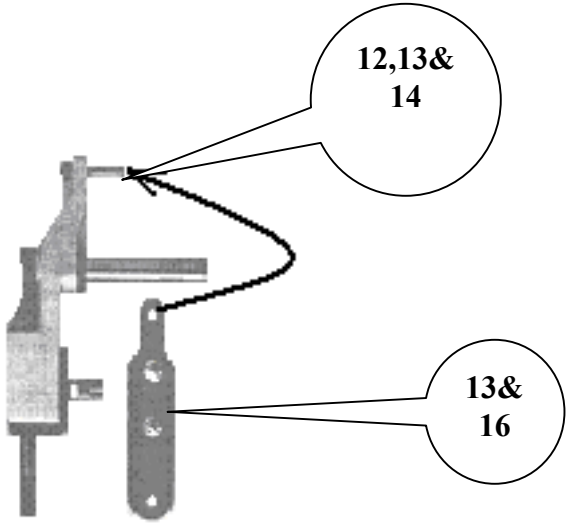
12. Remove C-clips, spring, collar and strap from the old stitch length lever.
13. Mount the smaller part of connecting strap on bolt and secure it with the collar the parts must move play free and without any play.
14. Mount the spring with the longer end on bolt and secure it with the C-clips



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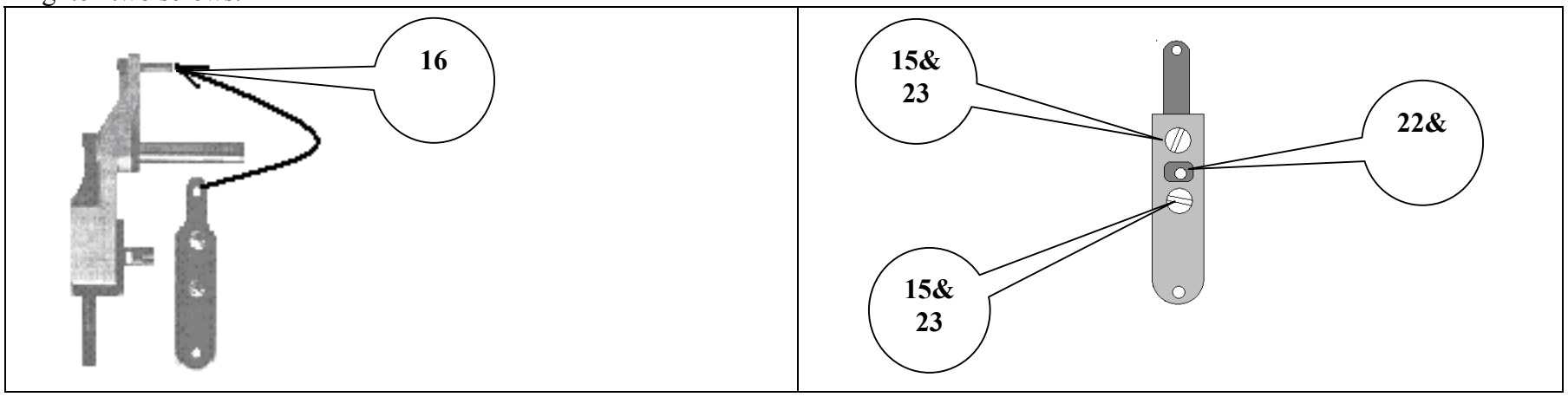
Installation:

15. Loosen the two screws on connecting strap.
16. Hold spring and connecting strap and lower the mechanism with stitch length lever down into the machine.
17. Mount strap on pin and secure it with collar Make sure stitch length lever is exposed through the front of the machine.
18. Rotated the stitch length lever in clockwise direction until the stop (stitch length zero).
19. Mount step pulley back on and tighten the two screws. Adjust the belt tension.
20. Install all the knobs and line them up with the marks on the faceplate.
21. Lift stitch length lever up and line up slide arrow with the zero mark on the faceplate; also the slide arrow should be in the center of the faceplate slot, tighten screw.
22. Align the connecting strap so that the adjusting hole for the buttonhole is in the center of the rectangular cutout.
23. Tighten the two screws slightly
24. Rough adjustment:
    Set Buttonhole "0"
    Set Stitch length "0"
    Slightly loosen the two screws on connecting strap.

Place a piece of fabric under the presser foot and run the machine. Now turn the buttonhole tool until the fabric remains stationary. Tighten two screws.



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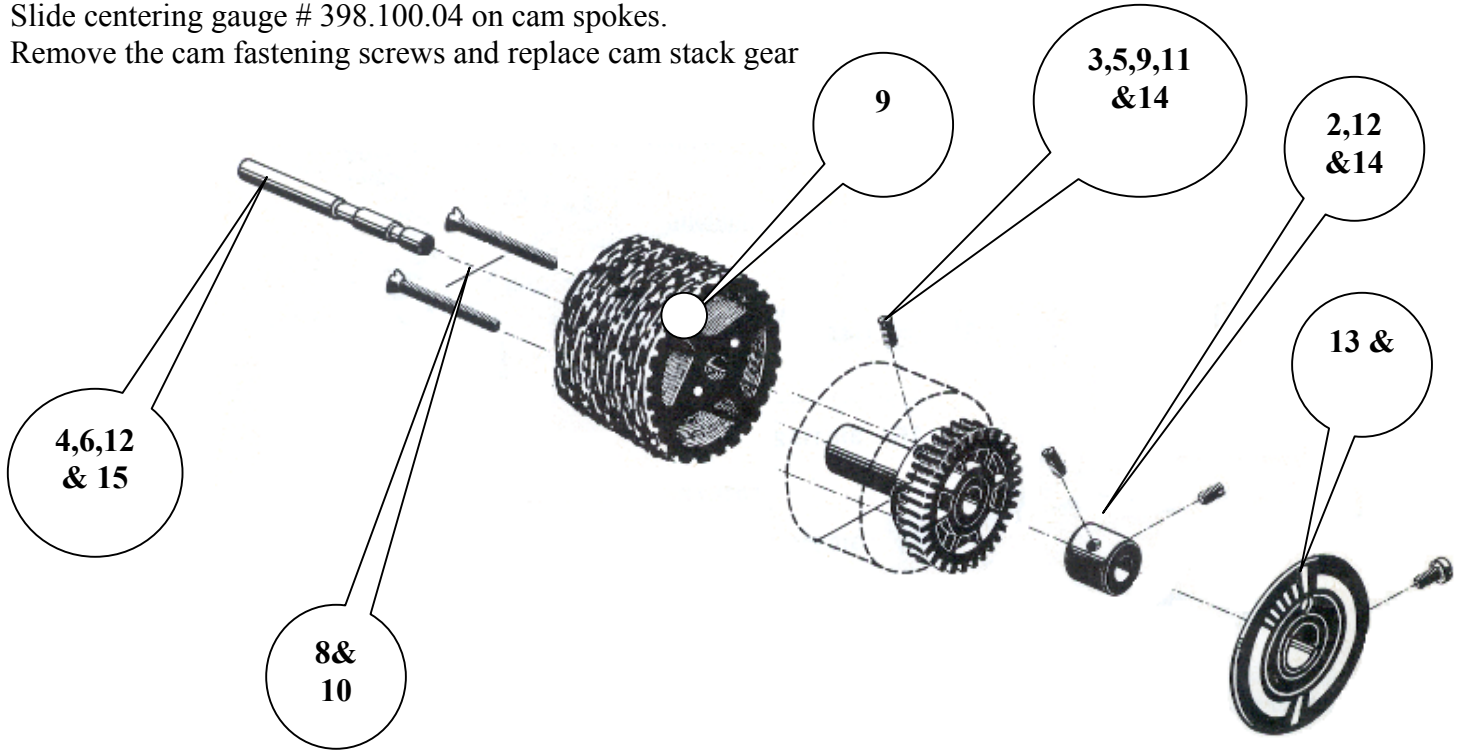
2.4 Cam Stack Gear

Code D

1. Remove the spool cover.
2. Loosen both screws on pattern indicator collar.
3. Turn the handwheel until the cam stack fastening screw points straight up and needle bar is in its highest position. Make sure not to turn the hand wheel anymore.
4. Fasten special pulling screw # 330.030.13 on the camshaft.
5. Loosen screw
6. Pull the shaft and remove the cam stack.
7. Slide centering gauge # 398.100.04 on cam spokes.
8. Remove the cam fastening screws and replace cam stack gear



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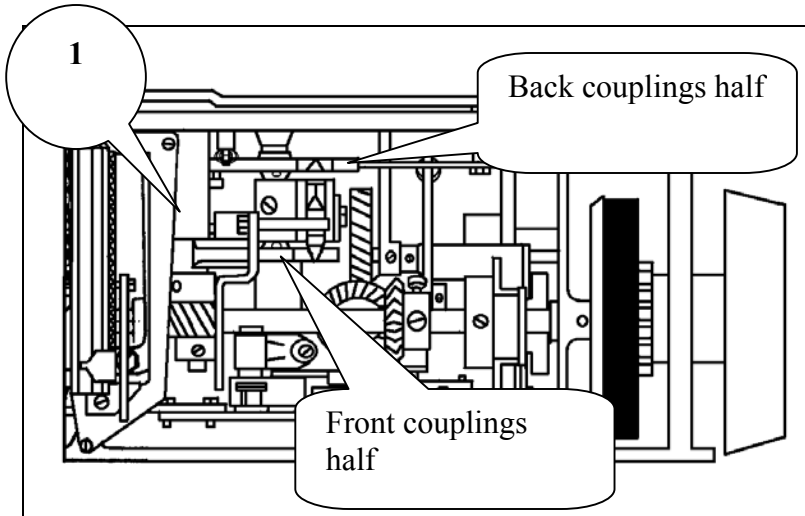
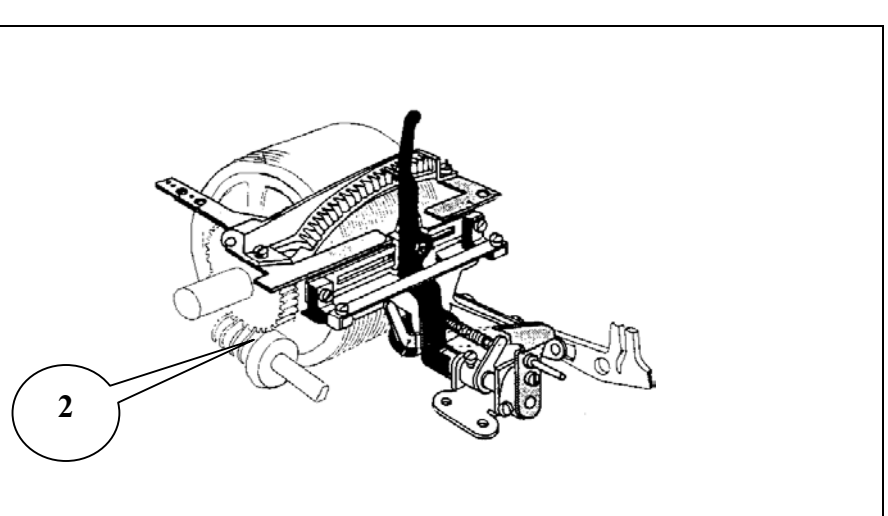
9. The screw should be in line with the stamped numbers on the cams.
10. Tighten the cam fastening screws.
11. Place the cam stack gear into the machine so that screw points straight up.
12. Insert the shaft, mount the pattern indicator and tighten the two screws making sure the shaft is flush with the bushing in the back.
13. Turn pattern indicator so that black line (half pattern mark) is between 11 and 12 o'clock.
14. Remove any play between the cam stack gear and the pattern indicator and tighten screws.
15. Remove special screw and mount spool holder.

For a rough adjustment:

1. Select stitch #17 and rotate the hand wheel and check if the two coupling halves are completely synchronized.
2. Make a rough adjustment by rotating the worm gear below the came stack gear to synchronize the couplings halves.





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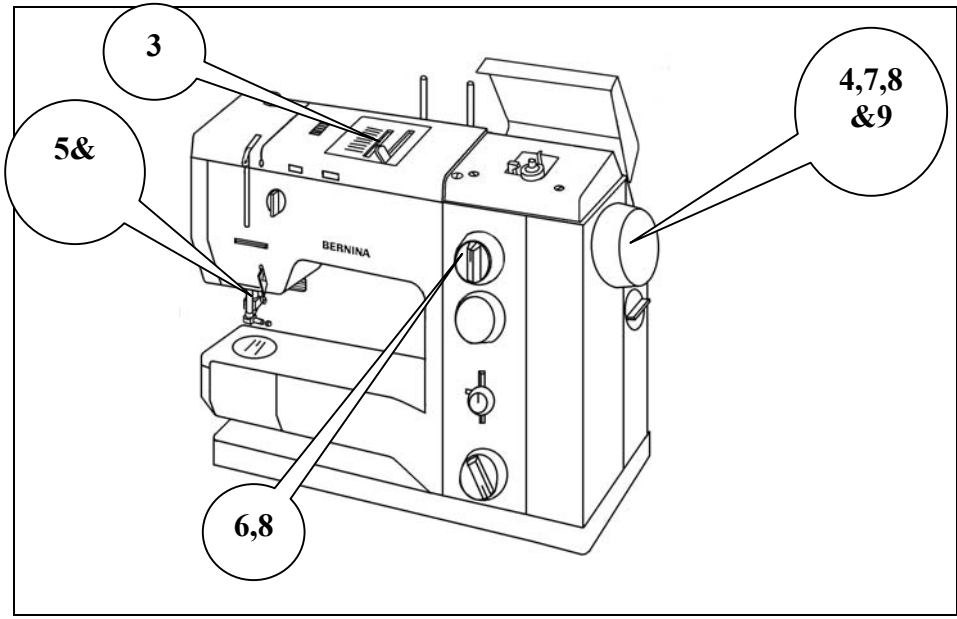
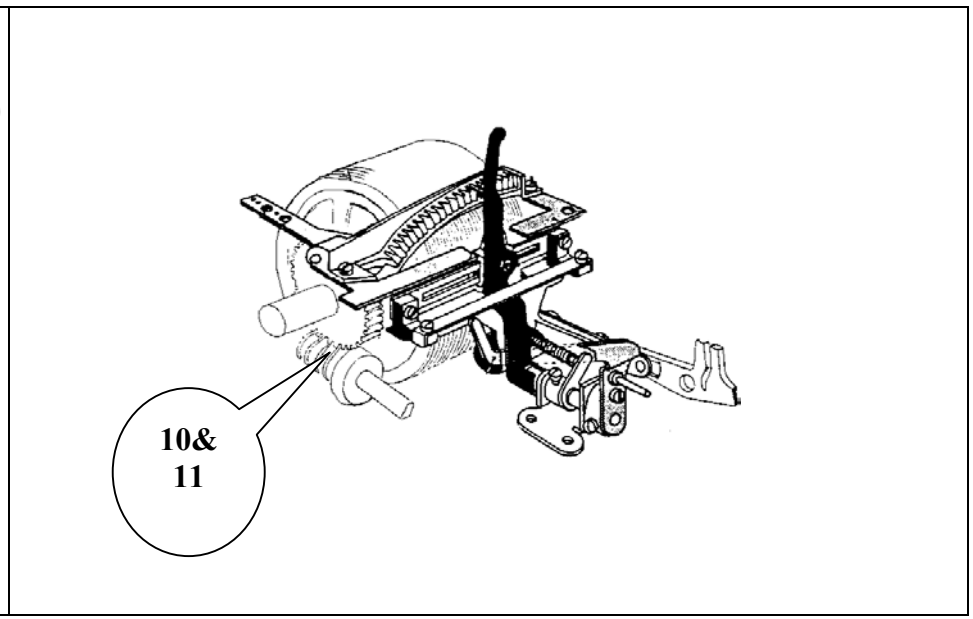
For a final adjustment:

3. Select stitch # 17, stitch width "4", changeover lever at 1...20.
4. Rotate the hand wheel until; the needle reaches its widest stitch width.
5. Move needle to its highest position.
6. Rotate the stitch width knob back and forth from "0" to "4", "4" to "0". The needle must remain stationary.
7. If not, bring the needle to the highest position and make a mark on the handwheel and the machine frame.
8. Then turn the handwheel clockwise or counter clockwise, whichever way the needle movement decreases, while moving the stitch width knob "0" to "4", "4" to "0".
9. Rotate the hand wheel until the needle is stationary and mark the handwheel again.
10. Loosen the screws on the worm gear. Using a screwdriver, hold the worm gear in place while rotating the hand wheel exactly the same distance as marked on the handwheel, **but in the opposite direction**.
11. Then tighten the worm gear screws and repeat the test.





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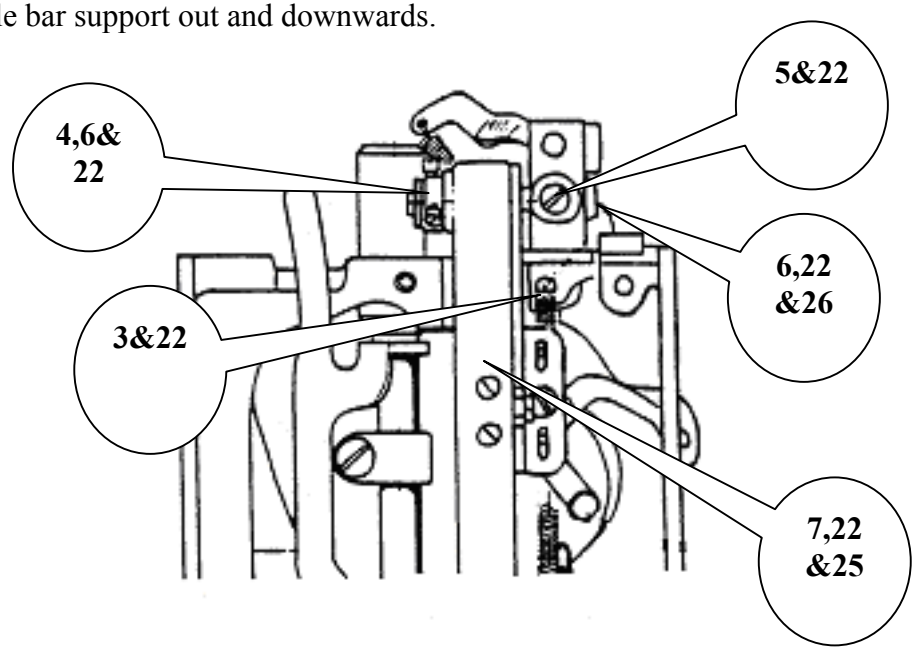
2.5 Take-Up Lever

Code B

Removal:

1. Remove top and light cover.
2. Remove light socket, thread catcher, cushioner and spring.
3. Loosen screw in the frame.
4. Loosen the two screws on the collar and
5. Loosen the screw on aluminum support,
6. Remove the collar and shaft.
7. Carefully swing the needle bar support out and downwards.



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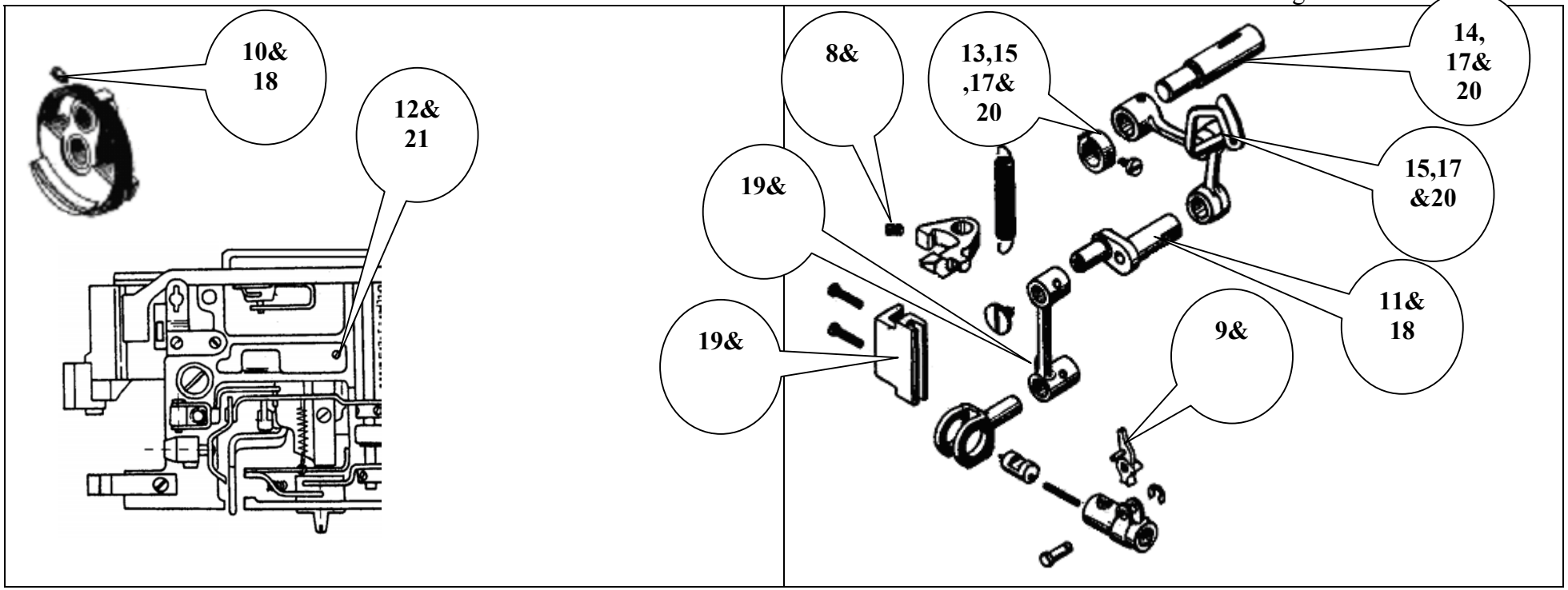
8. Loosen the screw on the aluminum needle bar guide
9. Disengage the needle bar and remove all parts.
10. Loosen screw on the counterweight and turn screw halfway out.
11. Slide piece out carefully.
12. Loosen screw and rotate it halfway out.
13. Loosen screw on the collar.
14. Slide shaft to the right until it stops on the cams.
15. Remove collar and take up lever linkage to the left

Note: for Model 930 with the needle bar clutch removed check if the clutch mechanism needs to be disassembled for cleaning.



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Installation: (Note: Lubricate all components prior to installation.)

16. Install needle bar clutch and needle bar guide and engage needle bar (930).
17. Install take up lever part on shaft and remove any play by moving the collar.
18. Mount linkage back into the counter weight and tightened screw down on the location flat.
19. Rotate the hand wheel one revolution and check if the lower part of the take up lever moves very easily within the needle bar link guide. The guide can be adjusted buy loosening the two fastening screw of the guide.
20. Slide shaft, collar and take-up lever to the right until they stop.
21. Tighten screw into the V-groove of shaft.
22. Swing needle bar support up and install the shaft and collar (930).

Check:

23. Select stitch width "4".
24. Set changeover lever between "0" and" 1- 20" (not engaged in either position)
25. The needle bar support should move freely.
26. To correct, move upper end of the needle bar support to either the front or back, to obtain the least amount of friction. Go through all long stitch and basting adjustments and the entire sewing-in procedure.

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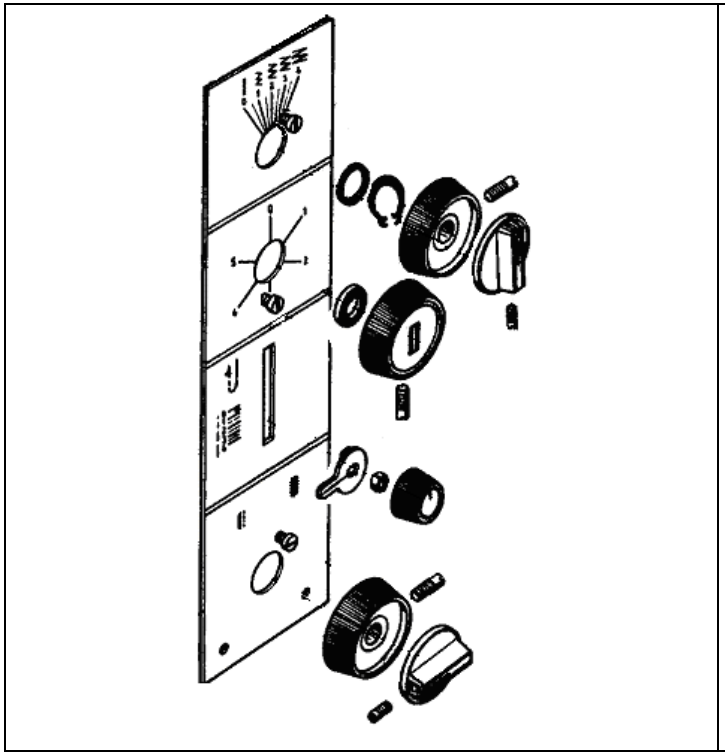
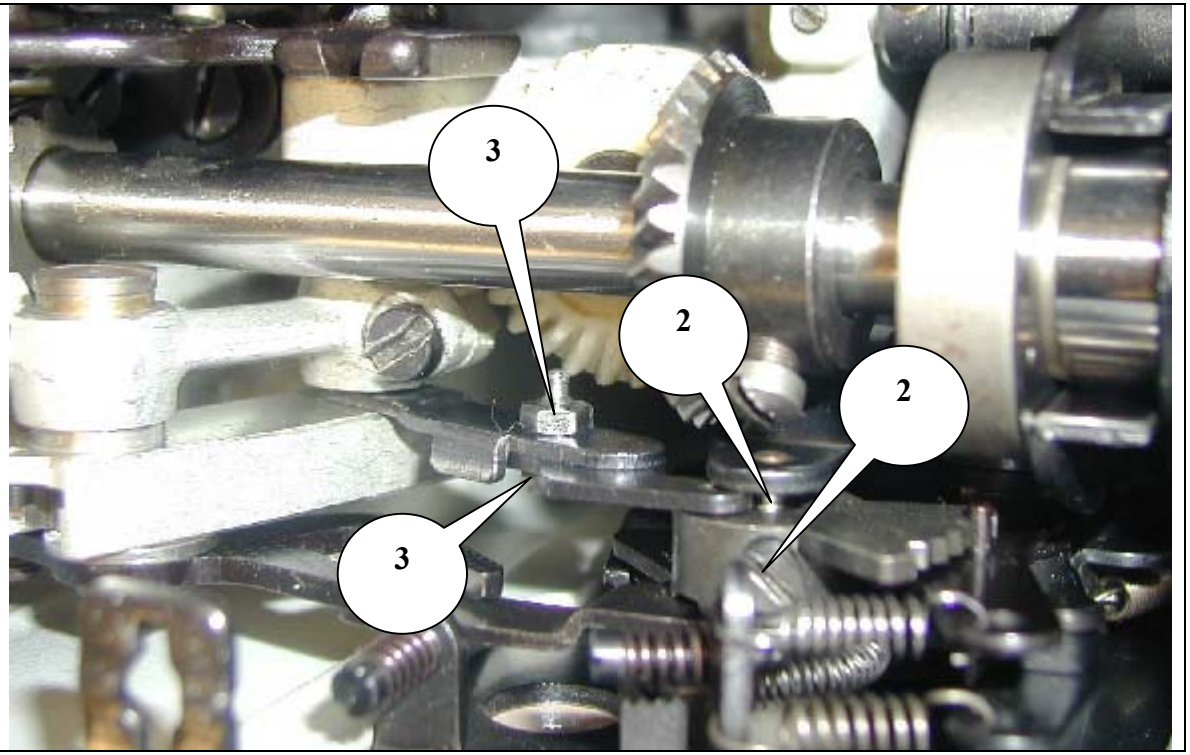
2.6 Buttonhole Mechanism

Code E

Removal:

1. Select buttonhole # 5 and stitch length 0mm.
2. Loosen the screw on the notched segment and pull out the needle position shaft.
3. Or disconnect the connecting strap.
4. Remove all the knobs.
5. Remove faceplate.
6. Remove four screws from the buttonhole plate and take out the whole mechanism carefully.





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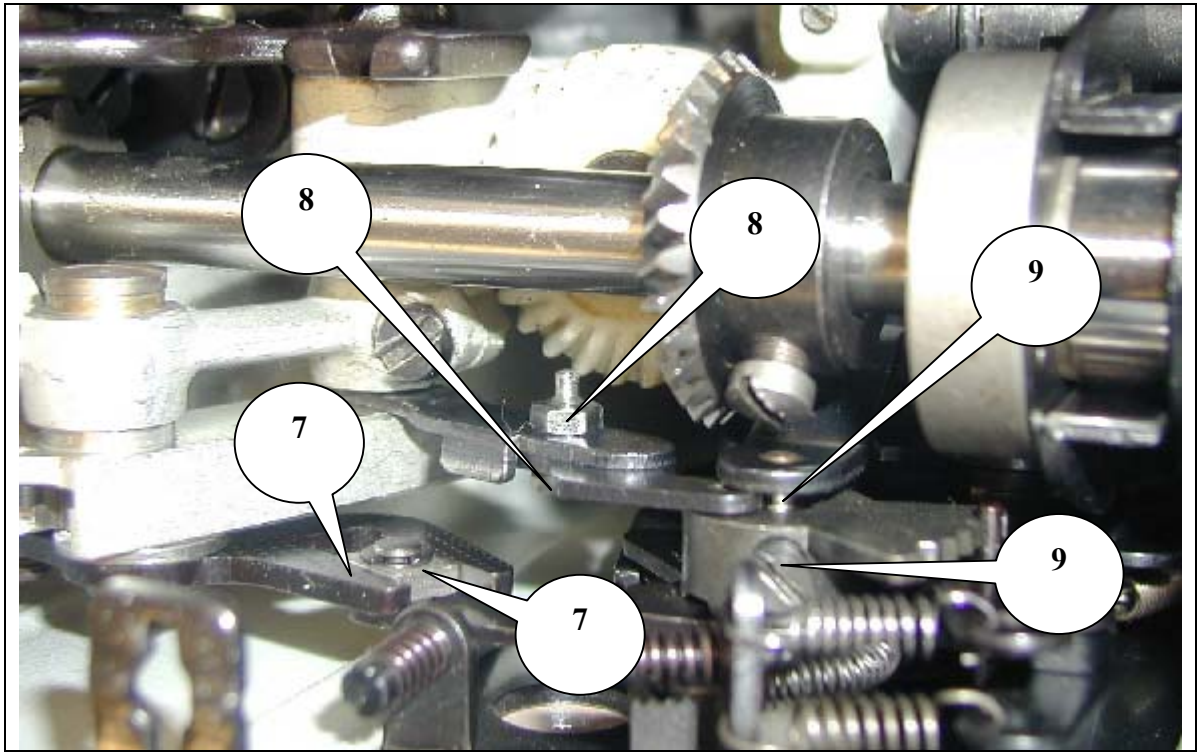
Installation:

7. Carefully place the buttonhole mechanism back into the machine and make sure the slide stone on the stitch width-changing lever is placed in the stitch width crank.
8. Tighten the buttonhole base screws.
9. Mount the needle-positioning shaft and tighten the screw in the location flat of the shaft.
10. Connect guide links, but do not tighten the screw or nut or fasten the screw on the notched segment. An adjustment must be done later to bring the needle in the center of the stitch plate.
11. Mount faceplate and knobs back on, making sure knobs line up with the marks on the faceplate.



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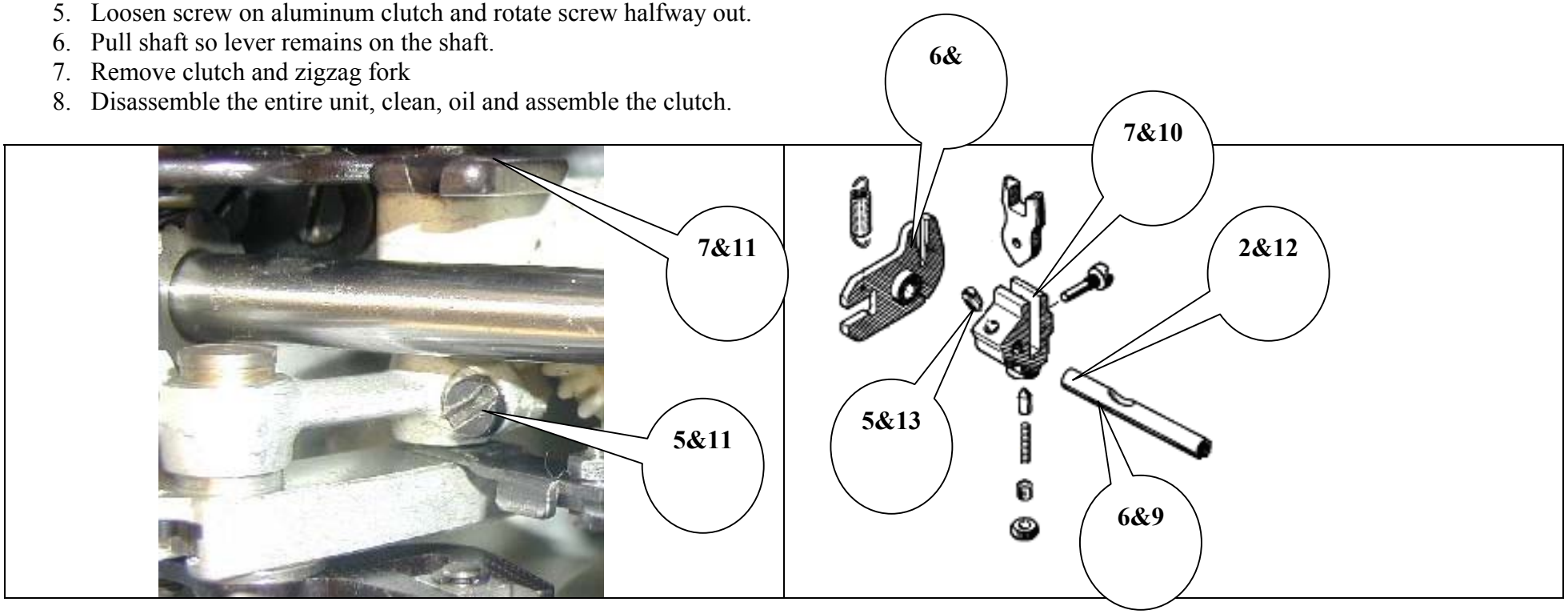
2.7 Changeover Lever

Code B

Removal:

1. Remove the spool pin cover.
2. Fasten special screw #330.030.13 on shaft
3. Turn hand wheel until the hole in the zigzag eccentric points to the left hand side and needle bar is at its highest point.
4. Loosen screw on the aluminum rocker arm.
5. Loosen screw on aluminum clutch and rotate screw halfway out.
6. Pull shaft so lever remains on the shaft.
7. Remove clutch and zigzag fork
8. Disassemble the entire unit, clean, oil and assemble the clutch.



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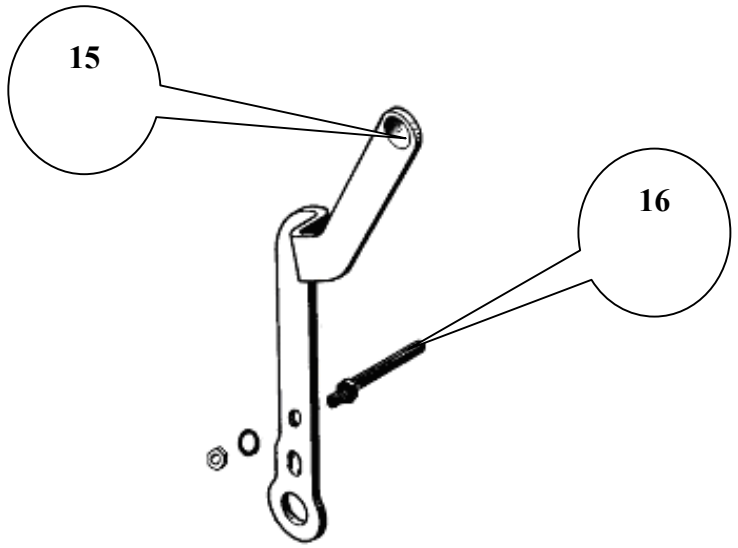
Installation:

9. Install shaft carefully
10. Install clutch,
11. Install zigzag fork and aluminum rocker lever one by one,
12. Align the shaft flush with the bushing in the back.
13. Tightening screw on the location flat or V-groove of shaft.
14. Select stitch width 4mm, set aluminum rocker lever roughly so that needle pierces within the stitch plate,
15. Check to see if changeover lever actuating pin pushes the clutch fork far enough to be engaged either to front or rear (rigidly or spring loaded needle bar in “one click”.
16. Perform the adjustment (930 only), loosen the 5.5mm nut and turn bolt on the eccentric. Adjustment for the 830 and 730 carefully reform bolt.



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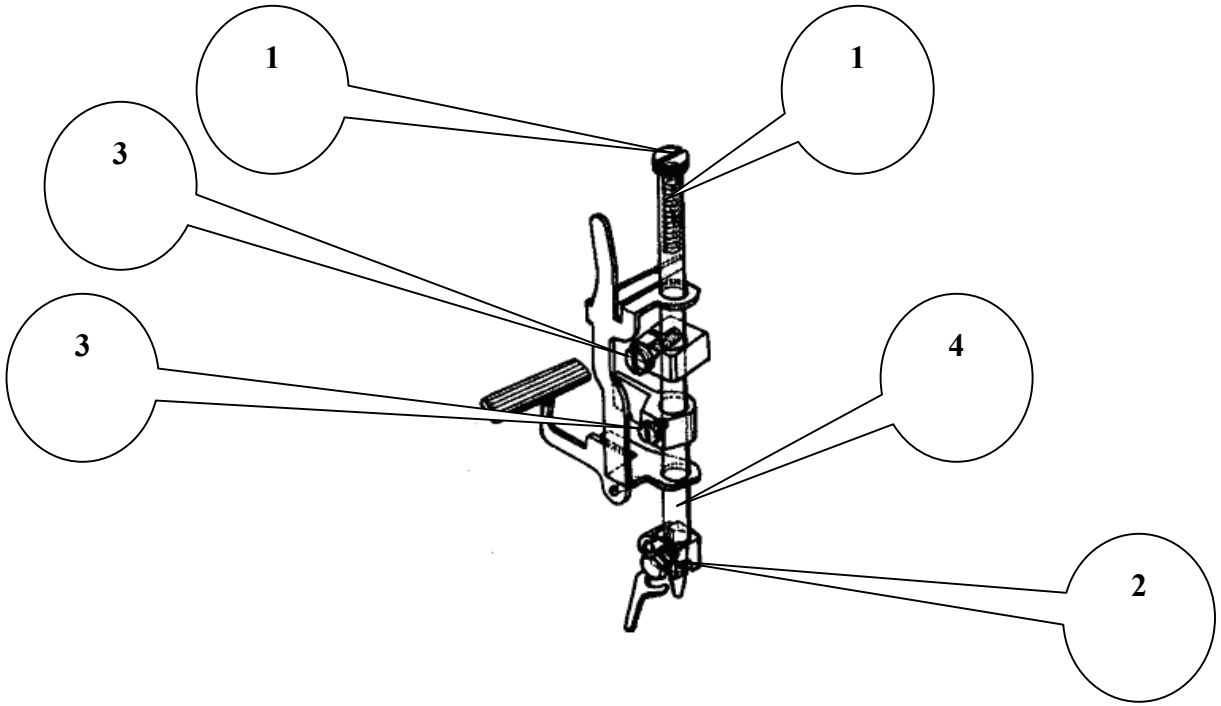
2.8 Presser Foot Bar **Code F**

If the presser foot is sluggish or only moves down slowly, the presser foot bar may need to be taken out for cleaning.

Removal:

1. Remove screw and pressure spring carefully. Warning: the spring is under a lot of pressure.
2. Remove presser foot clamp by removing screw and loosening screw.
3. Loosen screws on presser foot bar guide, clamp piece and take out parts. For Model #910/801: Loosen nut and hex screw and take out parts.
4. Pull presser foot bar up and remove it.
5. Clean presser foot bar and bushings and check for free presser foot movement.



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Installation:

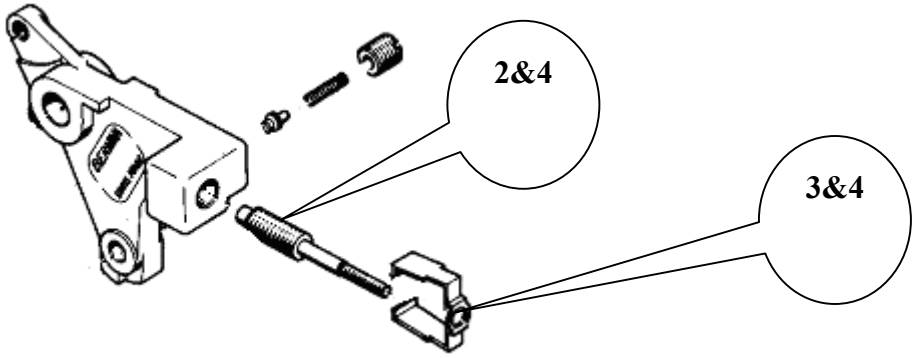
1. Install all parts in reverse order of removal.
2. Oil the presser foot bar and bushings and mount pressure spring. Turn screw approximately 2mm down into the sleeve.
3. Install presser foot clamp.

2.9 Stitch Length Stop Clamp.

Code C

If the stop clamp is missing the entire stitch length knob, stopper and shaft can be removed in one piece. Internally the remaining stitch length mechanism drops down.

1. Select stitch length 0mm, buttonhole 5mm and remove all knobs and face plate.
2. If the stitch length lever is completely removed mount stitch length knob, lift up the length lever so that the lever can be screwed back in place in the correct angle, without damaging the threads.
3. Remove all debris from broken part inside the machine.
4. Snap on new stopper over the shaft and clamp onto the back of the length lever.
5. Place the faceplate back on to the machine, mount all knobs and line up the knobs with the faceplate.



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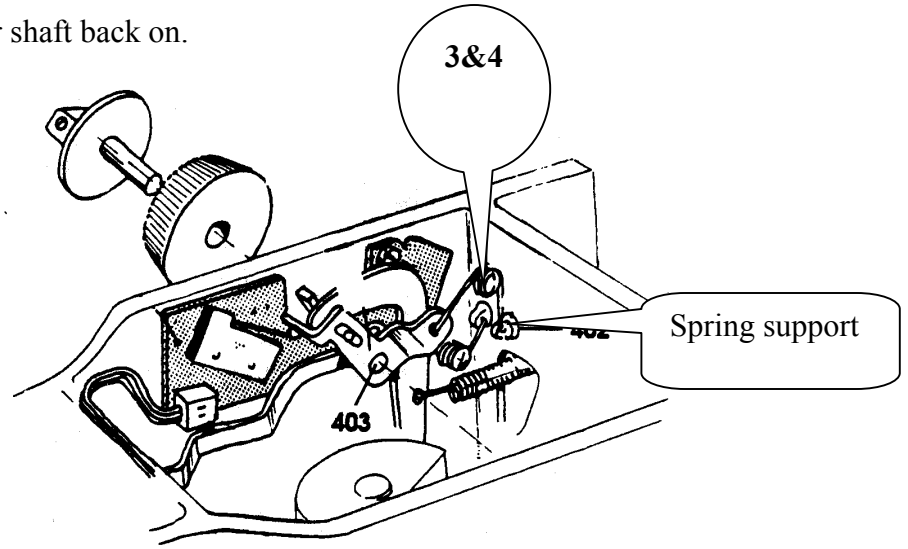
2.10 Changeover Knob Red/Green

If the changeover knob does not stay in its selected position and keeps moving while sewing, the spring support (white) should be replaced with spring a support #314.210.03 (black):

1. Remove the top cover, turn the machine upside down, and secure it carefully on the workbench using two pieces of wood. Make sure the machine does not rest on LED, spool holder or thread puller.
2. Remove the knee lever shaft and base plate.
3. Mount spring on the end of lever so the circled part stays up
4. Hook the spring on the spring support so that the longer part of the spring support points up. Hold the two parts together by using needle nose pliers and hook spring support in the proper hole.
5. Check for proper operation.
6. Mount base plate and knee lever shaft back on.



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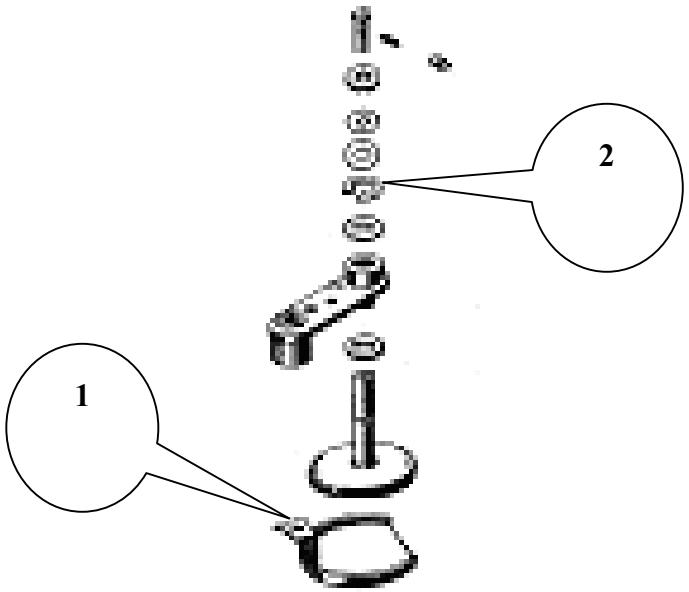
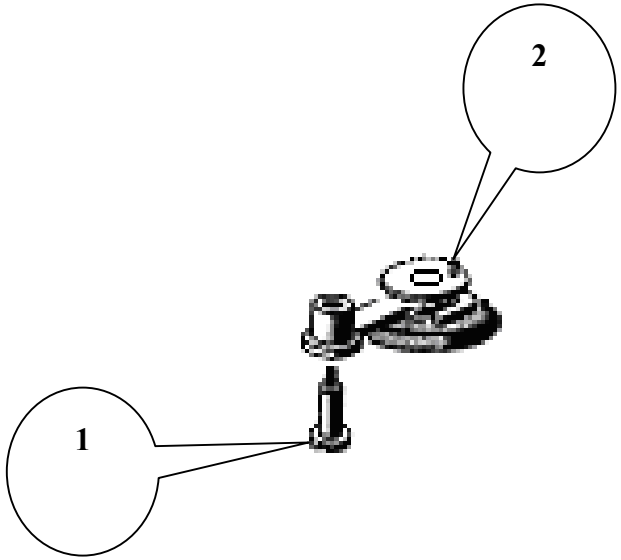
2.11 Bobbin Winder

730 Bobbin Winder	830 Bobbin Winder
1. Remove screw and cover. 2. Remove C-clip and exchange the bobbin winder.	1. Remove setscrew and replace bobbin winder. 2. Make sure the pin in the white disc fits inside the metal fork.
	

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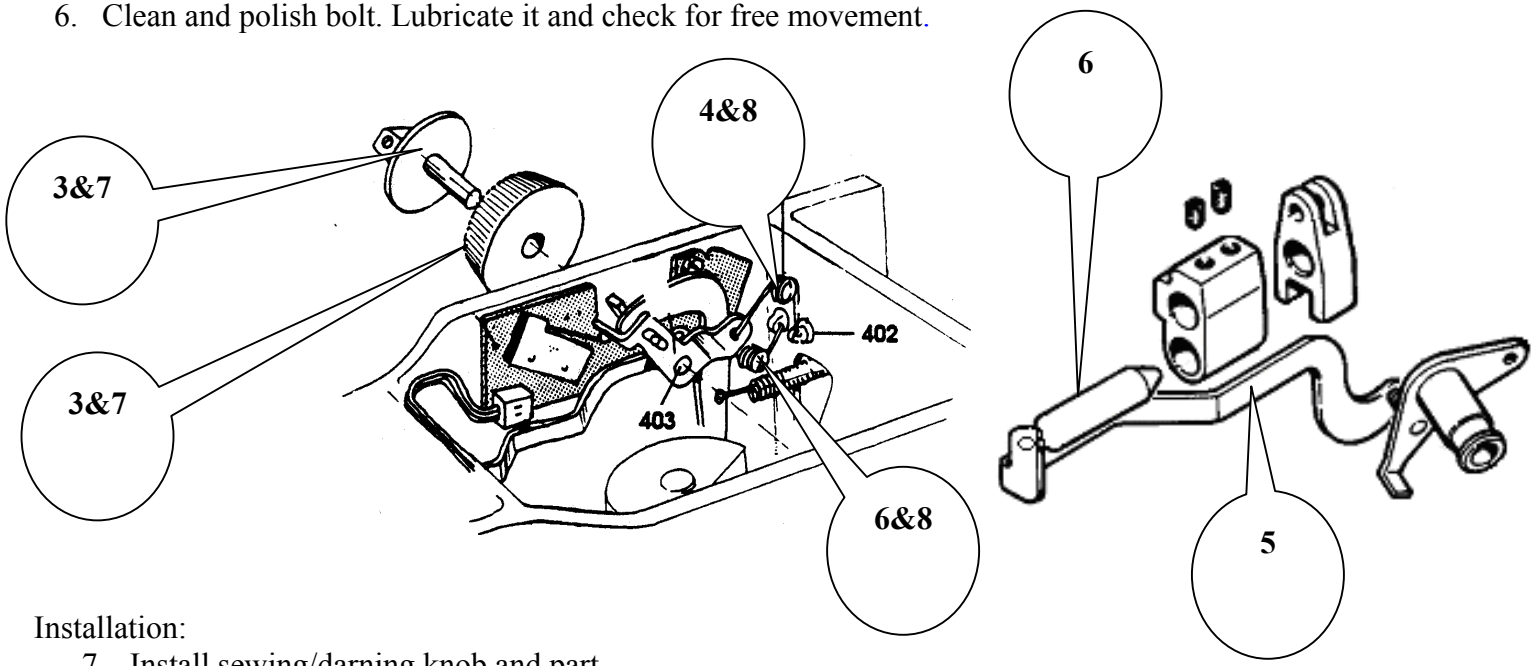
Code B

2.13 Sewing/Darning Mechanism

Removal:

1. Turn machine upside down and secure it to the workbench using two wooden blocks.
2. Loosen one or two screws from the shaft and remove the shaft. Remove all screws from the plate and remove base plate.
3. Remove the sewing/darning knob by loosening screw. 930 also remove the red/green selector knob.
4. Remove spring and spring support(s)
5. Move part to the left and take it out. If the bolt does not move, tap it carefully.
6. Clean and polish bolt. Lubricate it and check for free movement.



Installation:

7. Install sewing/darning knob and part.
8. Mount spring in the center hole of lever and secure spring with spring support in the machine housing.
9. Model 930 with feed dog drop mechanism adjusts 38mm distance from collar.
10. Install the base plate and free hand lever shaft play free and make sure the set crew is very tight.

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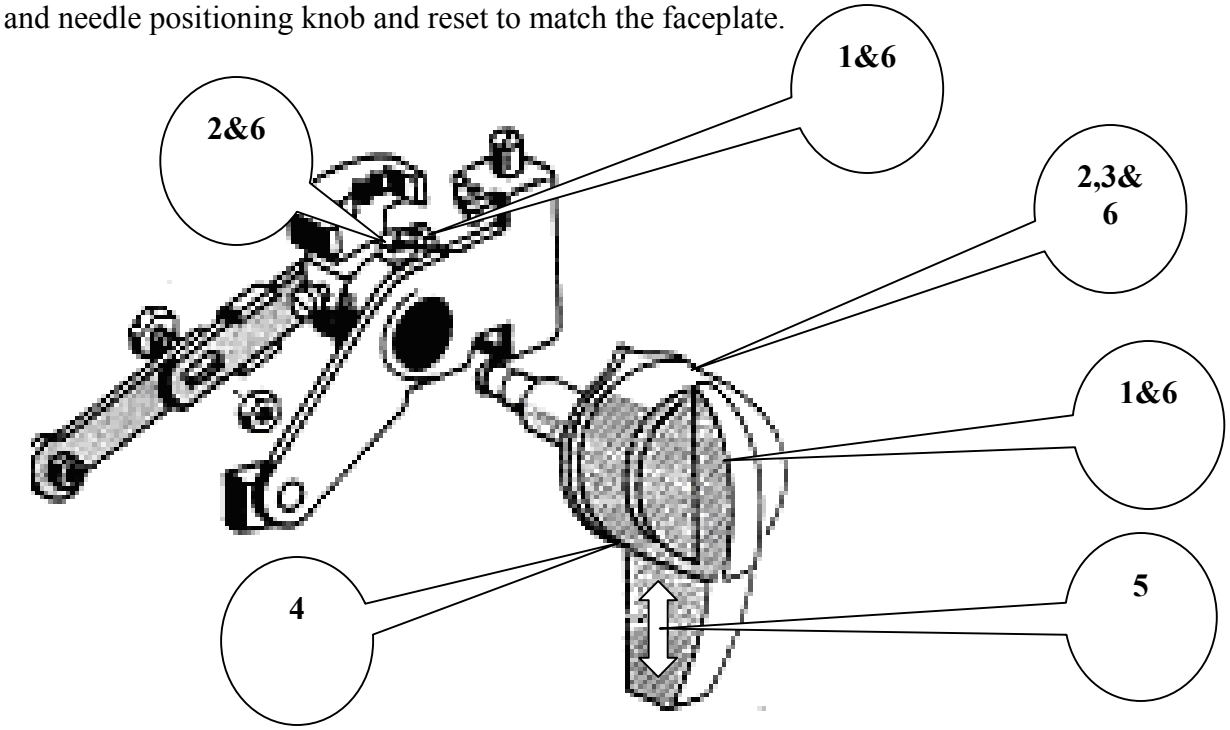
2.14 730 Stitch Width Knob

Correction:

1. Loosen screw and remove the needle positioning knob
2. Loosen screw and remove the stitch width knob.
3. Place the entire stitch width knob in hot water.
4. After a few minutes of soaking with a mid-size screw drive go between the end of the lever and the knob and carefully pry to loosen the wing. **Warnings do not force the wing, as the plastic might be brittle.** The part is no longer available.
5. Once the lever move freely apply light lubricant.
6. Install the stitch width knob and needle positioning knob and reset to match the faceplate.



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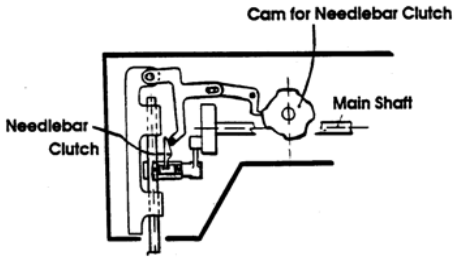
SECTION 3: ADJUSTMENTS

3.1 Long and Basting Stitch (Model 930)

With stitch length selection 4mm and the "long stitch" engaged the machines sews every other stitch thus achieving a maximum stitch length of 8mm. With the "basting stitch" engaged the machine sews every sixth stitch thus achieving s stitch length of 24mm.

Part	Description
Cams	The cams control the motion for the coupling and decoupling of needle bar
Rocker/follower arm	The cam follower and the rocker mechanism swings from left to right. Each time the lever swings to the left the needle bar is being disengaged, each time the lever swings to the right the needle bar is being engaged.
Needle bar clutch	The needle bar is connected to the take up lever assembly by a needle bar clutch/clutch pin. The pin is moved by a release lever, each time the pin is out of the needle bar, the needle stays up, each time the pin is in the needle bar the bar moves up and down
Needle bar guide	The guide holds the needle bar straight while the needle bar is disengaged. The guide holds the needle bar in place for the clutch pin to find the hole in the needle bar.
Needle bar spring	When the needle bar is decoupled the spring pulls and hold the needle bar up.
Needle bar coushioner	The cushioner limits the height of the decoupled needle bar for the for the clutch pin to find the needle bar hole.
Thread catcher	The thread catcher holds the thread tight while the needle bar is disengaged.



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a. Needle Bar Guide

Move the take up lever ½ down, disengage the needle bar by pushing the release lever. Pull needle bar downward, the clutch should engage with one "click motion". If the lever does not engage, the needle bar could be twisted. If the lever moves sluggishly, disassemble the clutch mechanism to remove possible lint and dried oil. rather than using solvents to free up the part.

Correction:

1. Remove the light switch.
2. Unhook the spring.
3. Loosen screw.
4. Move needle bar until it couples.
5. Put a 0.6mm feeler gauge between needle bar guide and hinge bolt.
6. Tighten screw.
7. Mount spring
8. Repeat the test.

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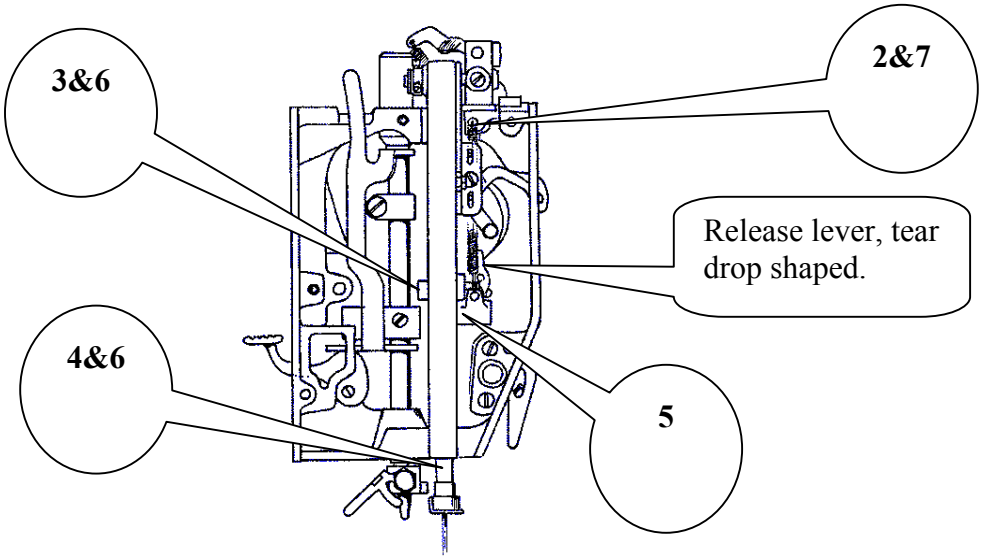

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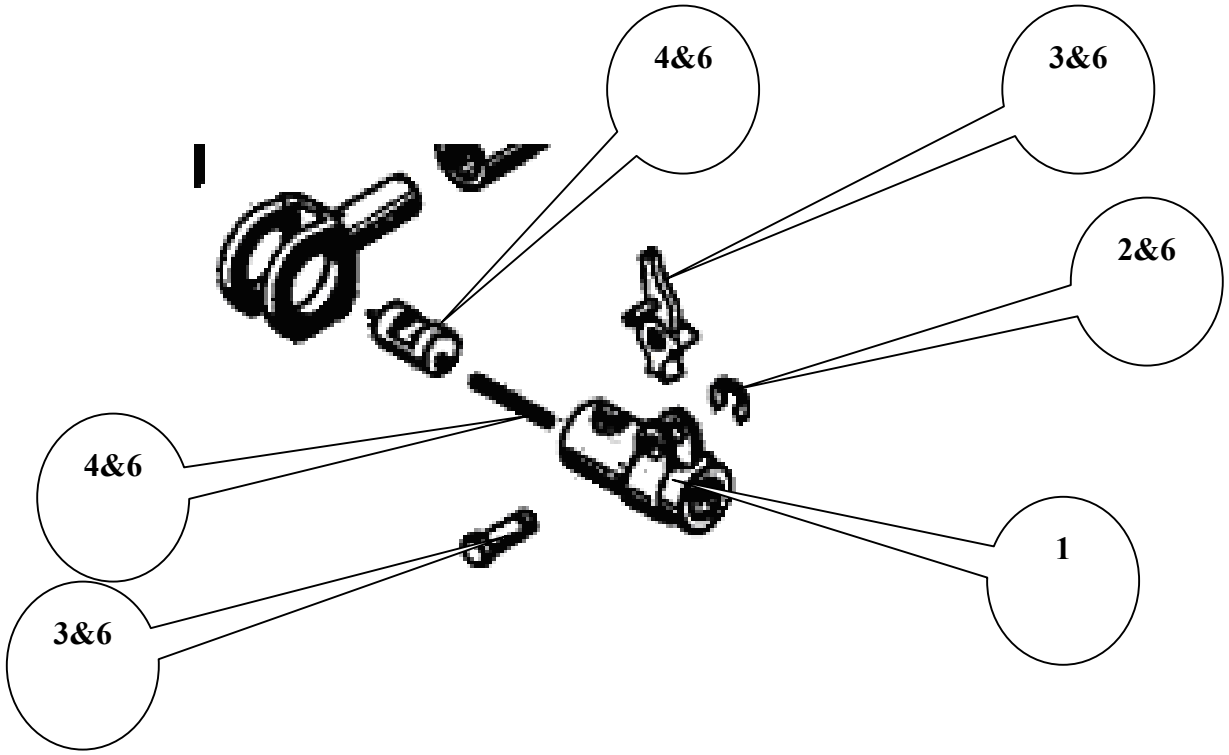
Servicing the Needle Bar Clutch:

1. To remove the clutch for service, refer to "take-up lever removal instructions in this manual."
2. Remove the small C-clip and shaft that holds the coupling lever together.
3. Remove the pivot pin and the coupling lever.
4. Then use a small screw driver and push the piston and spring out of its housing.
5. Clean and lubricate all parts.
6. Reassemble spring and piston, install clutch lever, shaft and C-clip, and install needle bar support.
7. Follow instructions above under "Needle Bar Guide".



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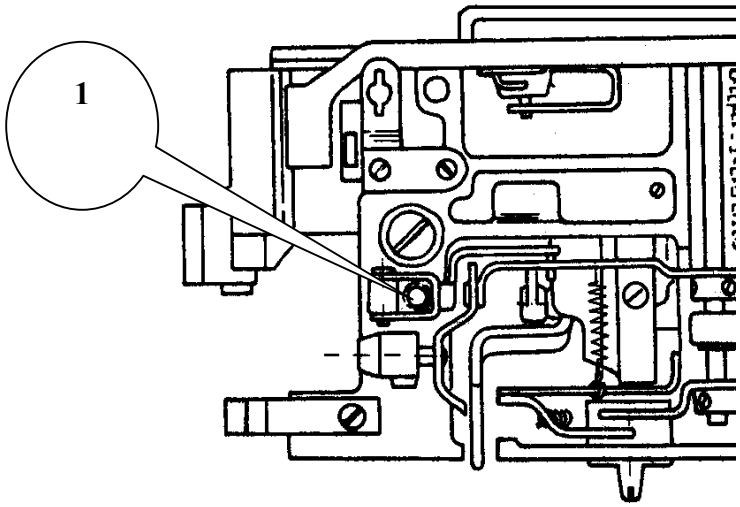
b. Needle Bar Cushioner
For the next adjustments the cushioner needs to be in a high position.

1. Turn cushioner # 122 up three complete revolutions.



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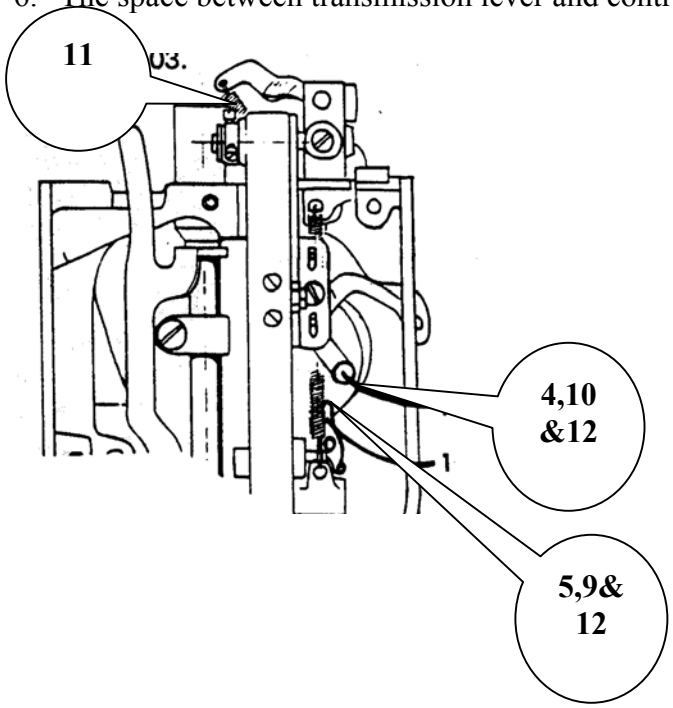
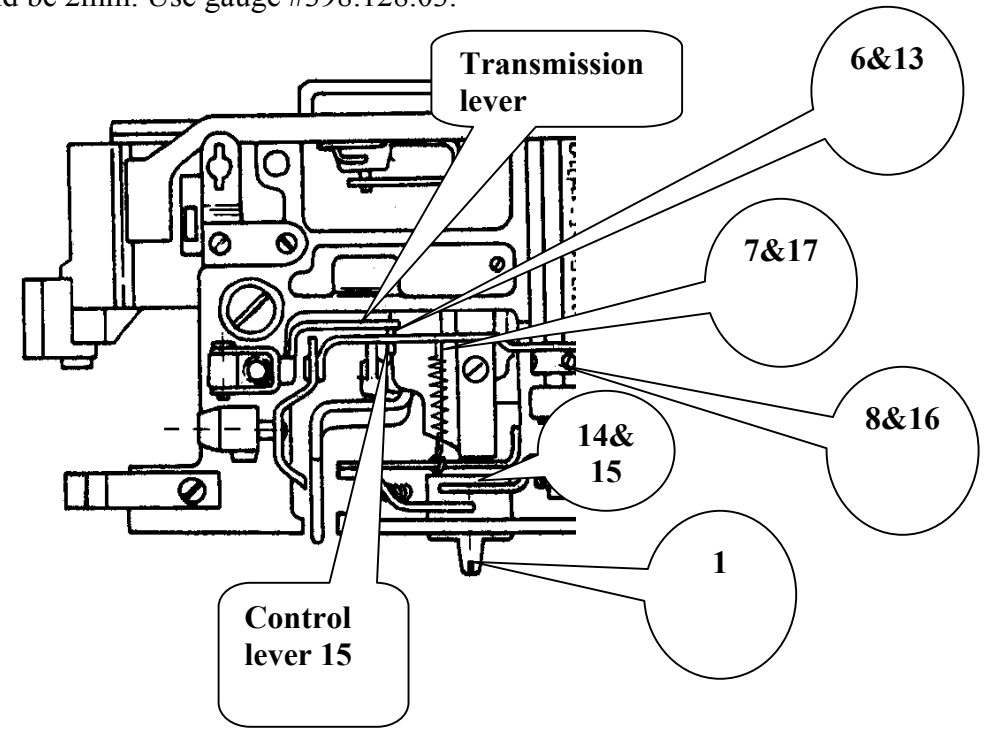
c. Control Lever

The control lever is supposed to swing to the left and right to couple and decouple the needle bar when doing the long and basting stitch. When the straight stitch is selected, the control lever should be in a resting position and not move at all.

Check:

1. Changeover knob vertical.
2. Stitch width "0".
3. Needle position knob center.
4. Mount the adjusting tool #398.129.03 (whistle shaped tool) over the lever.
5. Release lever should fit exactly in the cutout of mounted.
6. The space between transmission lever and control lever should be 2mm. Use gauge #398.128.03.





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Correction:

7. Disengage tension spring.
8. Loosen the two screws on transmission lever.
9. Make sure needle bar is always coupled.
10. Mount adjusting tool #398.129.03 on clutch lever.
11. Make sure the spring from the thread catcher is attached.
12. Turn hand wheel until release lever is the cut out of the adjusting tool. Bring needle bar to its highest position.
13. Place gauge #398.128.03 between transmission lever and control lever.
14. Follower arm should be on the flange and not on the diameter of the changeover cam.
15. Push follower arm very gently to the front, and lever to the rear.
16. Tighten the two screws on transmission lever.
17. Attach spring
18. Recheck the adjustment.

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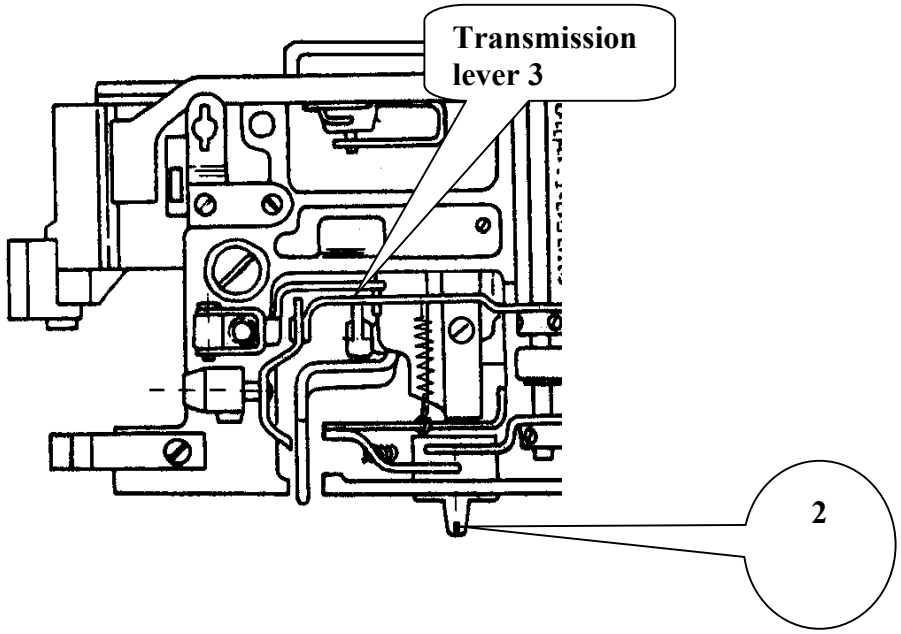
d. Control Cam

1. Set stitch width knob to "0".
2. Set changeover lever to the right (long stitch).
3. The upward motion of transmission lever has to be completed when the needle bar is in the highest position.



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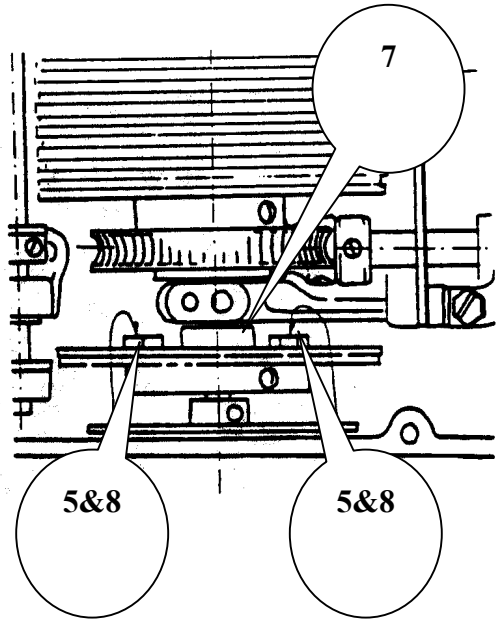
Correction:

1. Set the stitch width knob to "0"
2. Set changeover knob to the right (long stitch).
3. Remove the LED light b racket
4. Release the two cam fixing screws.
5. Turn hand wheel until the needle bar is decoupled. Both of the screws must be accessible at the same time.
6. Turn handwheel until the needle bar is at it highest point.
7. Turn cam in direction of motion until the tracer has reached its highest point on the cam as it rises.
8. Tighten the two screws.



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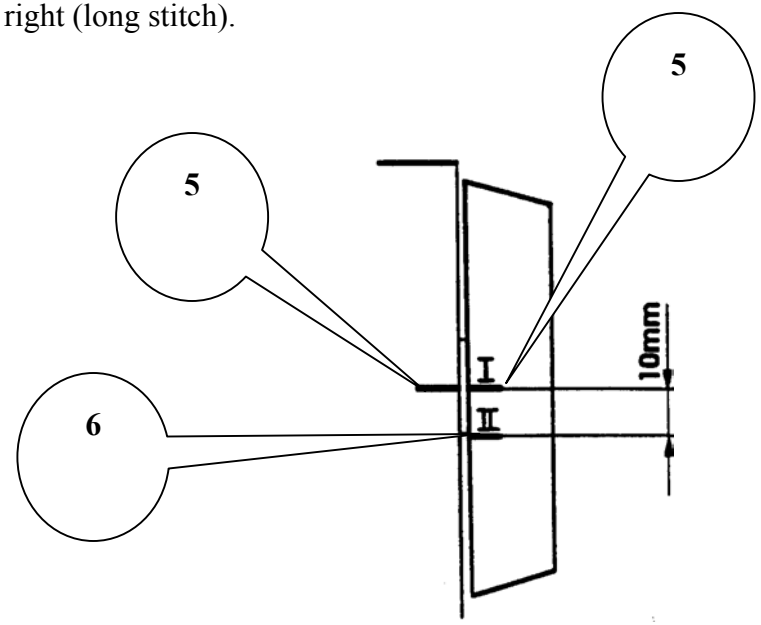
e. Instant of Needle Bar Decoupling

The needle bar must only be decoupled shortly before reaching the top "dead center" .For that, mark the handwheel as follows:

1. Changeover knob vertical.
2. Stitch width knob "0".
3. LCR knob "center"
4. While the needle bar remains engaged, turn the hand wheel until the needle bar reaches the maximum height.
5. Make a reference mark on the hand wheel and on the machine housing. This is the start position.
6. Now make a second mark 10mm below the first mark.
7. Set LCR knob left.
8. Set stitch width knob to "0".
9. Set changeover knob to right (long stitch).



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Correction:
There are two different ways to do the adjustment instant of decoupling the old style and the new style:

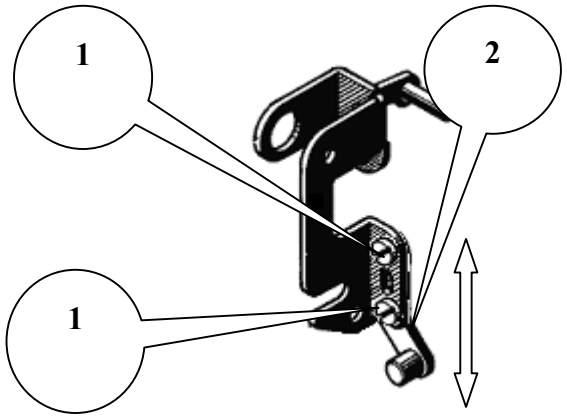
OLD STYLE:

1. Loosen screw and move clutch up and down.
2. Clutch lever can be adjusted in height.

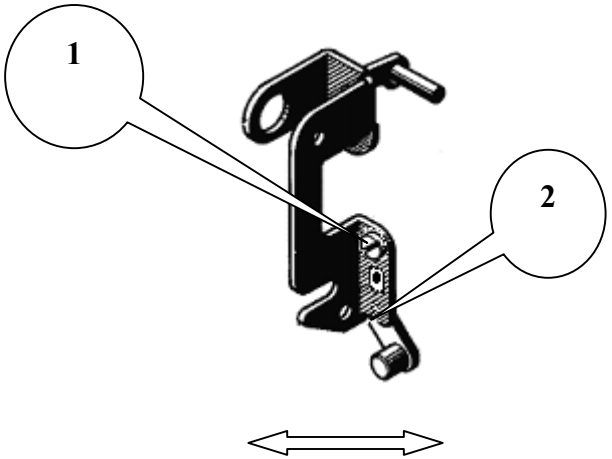
NEW STYLE:

1. Loosen screw very slightly and make adjustment with the eccentric tool
2. Clutch lever can be adjusted sideways.

NOTE: If lever #131 is too high, either the needle bar will never decouple, or it will decouple too late. If it is too low, the needle bar will decouple too early.



NOTE: If lever #131 is too far to the right, either the needle bar will never decouple, or it will decouple too late. If it is too far to the left, the needle bar will decouple too early.



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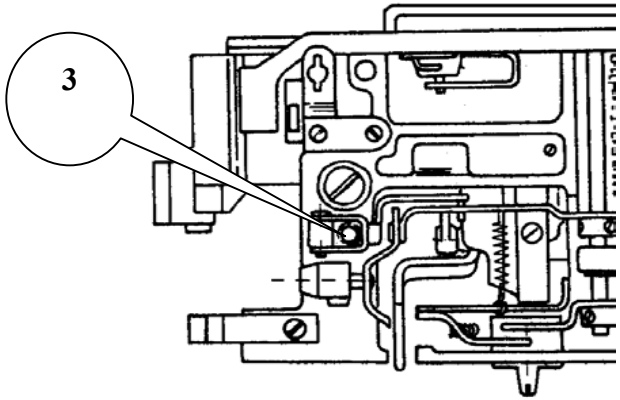
f. Adjust Cushioner

1. Set the changeover knob to right.
2. Set LCR knob to right.
3. Run the machine at fast speed and turn cushioner down slowly until the long stitch starts to work.
4. Decouple the needle bar and push it up for two seconds to compress the cushioner.
5. Immediately start to run the machine on fast speed.
6. The long stitch should start to work after a short delay of one second.
7. If the long stitch does not work, turn the cushioner down slightly.
8. Push the needle bar up and repeat point 4.

Final Check:

Turn the handwheel very slowly, observing the needle bar and release lever. The coupled needle bar should move up slowly, decouple and stay up; there should be no jump. The needle bar clutch moves down and up until it reaches the highest point. Then the release lever should pop out.

If it does not work as described, go through the entire long stitch adjustment again more carefully.



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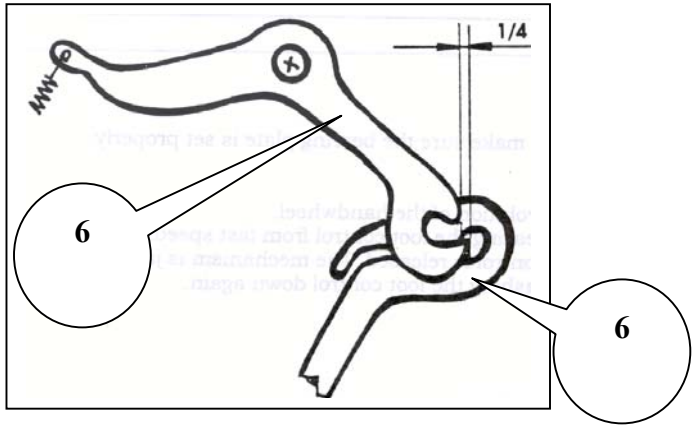
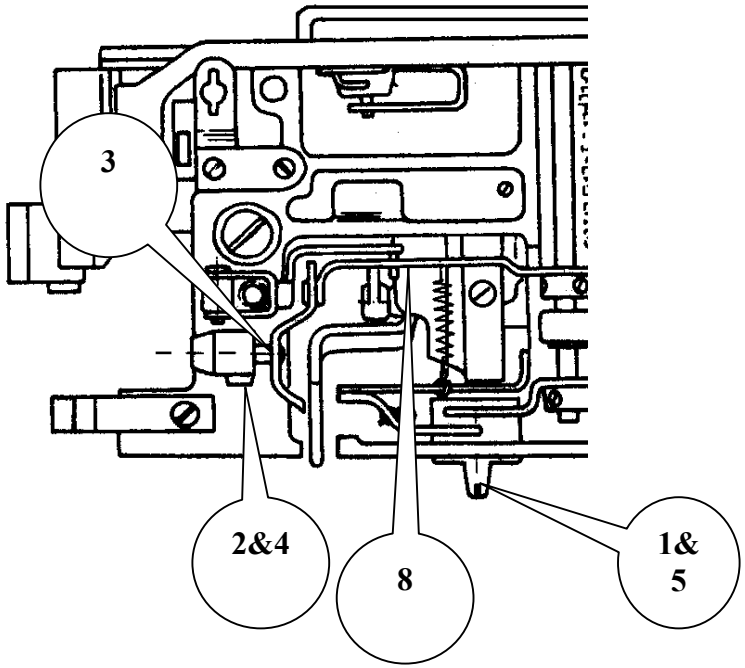
g. Thread Catcher Adjustment

The thread catcher lever should be set laterally so it lightly touches the take-up lever .

Correction:

1. Set changeover knob to right.
2. Loosen screw
3. Adjust lateral position of thread catching lever as required.
4. Tighten screw.





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Position of Thread Catcher to the Take-Up Lever:

5. Set changeover knob to right (long stitch).
6. Turn handwheel until thread catcher swings to the rear and take-up lever is on its down stroke.
7. The thread catcher tip should not cover more than one quarter of the hole in the take-up lever.
8. Loosen 2.5mm Allen screw and raise or lower the left part of lever to bring thread catcher to its proper position.

Final check:

When the handwheel is turned backwards, the take-up lever should not lift up the thread catcher lever.

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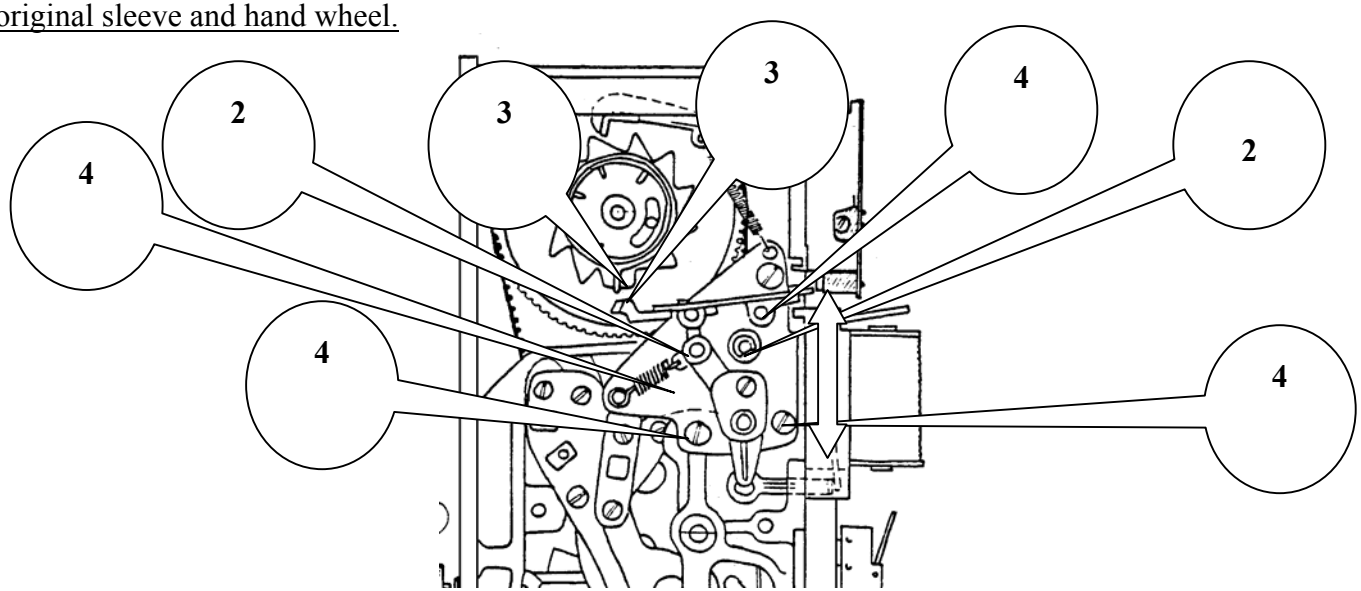
3.2 Setting the Needle Stop Up

a. Setting the Bearing Plate

In the working position, stop arm # 140 should engage approximately 1.7mm into the stop of the coupling sleeve.
To Perform the Adjustment:

1. Use special sleeve #305.239.00.
2. Press toggle lever on stop.
3. Turn main shaft in the direction of rotation until coupling sleeve is against stop arm. In this position stop arm should be flush with the special sleeve.
4. Loosen the three fixing screws, set bearing plate to the prescribed position and tighten screws.
5. Mount original sleeve and hand wheel.



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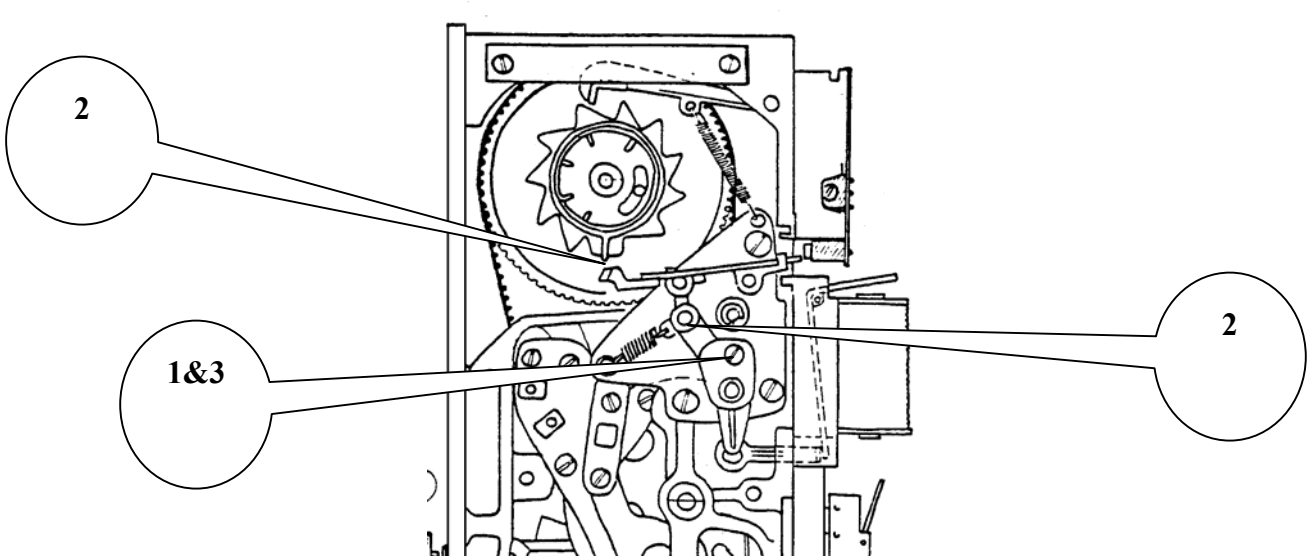
b. Setting the Latch Lift

Run the machine at full speed, and then unplug the foot control. Now two clicking sounds should be heard. One when the stop mechanism engages, the second when the mechanism releases.
Clicking noise with every revolution of the handwheel.

To Perform the Adjustment:

1. Loosen screw.
2. Move toggle lever in either direction until lever has approximately 1mm clearance from latch.
3. Tighten screw. **Be careful not to over-tighten the screw**



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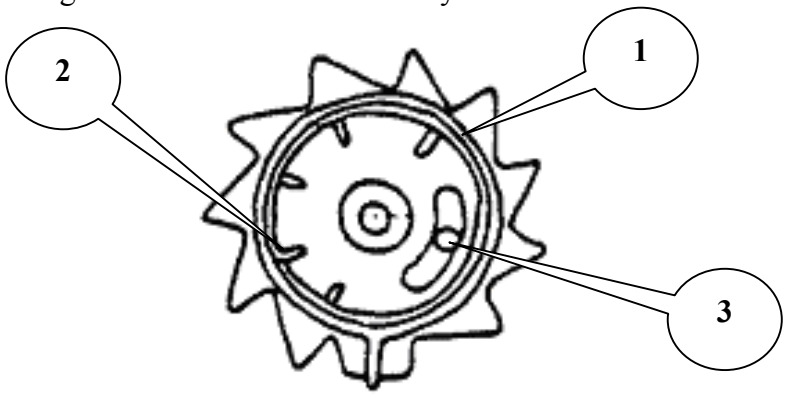
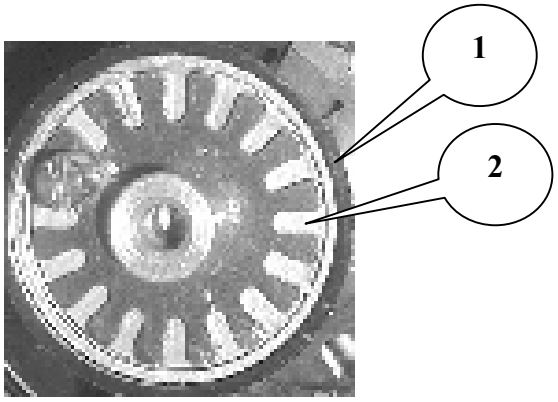
b. Positioning of the Take-Up Lever

Warning: The needle stop test must only be carried out with the handwheel fitted. Otherwise the coupling spring could detach damaged.

1. Set presser foot lifter lever down.
2. Re-fit handwheel.
3. Run machine and stop from fast speed. The take-up lever should be at the highest position.
4. Run the machine at slow speed and stop. The take-up lever should not be more than 20.0mm below the take-up lever's highest point.

Old Style Adjustment	**New Style Adjustment**
1. Remove sleeve. 2. Adjust the spring position by setting washer to one of its five notches until the take-up lever is roughly in its highest position. 3. For a fine adjustment, loosen shank screw # 155 and move setting washer #154 so the take-up lever stops exactly in its highest position. 4. Tighten shank screw #155 firmly. 	1. Remove sleeve # 141. 2. Adjust the spring position by setting washer # 154 to one of its fifteen notches until the take-up lever stops exactly at its highest position. 3. For a fine adjustment move the spring into the second sleeve position. 

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3.3 Setting the Needle Stop Down

(Only for 930/910 with 366-type foot control) When the foot control is compressed at the back, the needle should stop in the down position. If the take-up lever stops more than 20.0mm below its highest position, clean and oil the sleeve spring and shaft. If the problem persists, exchange the spring, check belt tension and check for a bind by rotating the hand wheel.

Rough Adjustment:

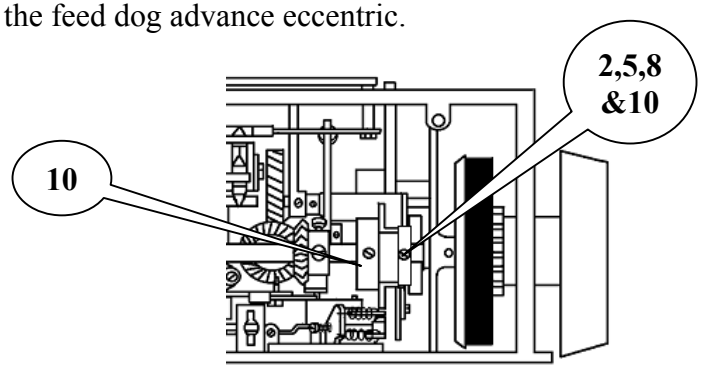
1. Turn hand wheel in sewing direction until the needle is on its downward stroke and the upper edge of the needle eye is flush with the needle plate.
2. The screw on the cam disc should point straight up.

First Fine Adjustment:

3. Turn handwheel in sewing direction until the needle is on its downward stroke and lower edge of the need1e eye is flush with the needle plate.
4. Compress the foot control at the back. The needle should stop in the up position.
5. Loosen the screw on the cam disc and move the disc several degrees in the sewing direction.

Second Fine Adjustment:

6. Turn handwheel in sewing direction until the needle is on its downward stroke and the tip of the needle is flush with the needle plate.
7. Compress the foot control at the back. The needle should stop in the down position.
8. Loosen the screw on the cam disc and move the disc several degrees opposite to the sewing direction.
9. Repeat adjustments until needle stops in the described position.
10. Push the cam disc to the left against the feed dog advance eccentric.



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